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**SCREENING SITE INSPECTION REPORT
FOR
KALAMAZOO COUNTY ROAD COMMISSION
KALAMAZOO, MICHIGAN
U.S. EPA ID: MID020899647
SS ID: NONE
TDD: F05-8810-022
PAN: FMIO781SA**

JULY 13, 1990



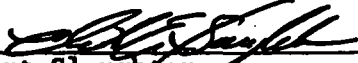
ecology and environment, inc.


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1. INTRODUCTION

Ecology and Environment, Inc., Field Investigation Team (FIT) was tasked by the United States Environmental Protection Agency (U.S. EPA) to conduct a screening site inspection (SSI) of the Kalamazoo County Road Commission (KCRC) site under contract number 68-01-7347.

The site was initially discovered by officials of Kalamazoo County Road Commission in January 1985 (Byrnes 1989). The site was evaluated in the form of a preliminary assessment (PA) that was submitted to U.S. EPA. The PA was prepared by C. Wallace of the Michigan Department of Natural Resources (MDNR) Site Assessment Unit and is dated March 21, 1986.

FIT prepared an SSI work plan for the KCRC site under technical directive document (TDD) F05-8703-077, issued on March 2, 1987. The SSI work plan was approved by U.S. EPA on October 4, 1988. The SSI of the KCRC site was conducted on July 25 and 26, 1989, under TDD F05-8810-022, issued on October 19, 1988.

The FIT SSI included an interview with site representatives, a reconnaissance inspection of the site, and the collection of 10 soil/sediment samples and 6 monitoring well samples.

The purposes of an SSI have been stated by U.S. EPA in a directive outlining Pre-Remedial Program strategies. The directive states:

All sites will receive a screening SI to 1) collect additional data beyond the PA to enable a more refined preliminary HRS [Hazard Ranking System] score, 2) establish priorities among sites most likely to qualify for the NPL [National Priorities List], and 3) identify the

most critical data requirements for the listing SI step. A screening SI will not have rigorous data quality objectives (DQOs). Based on the refined preliminary HRS score and other technical judgement factors, the site will then either be designated as NFRAP [no further remedial action planned], or carried forward as an NPL listing candidate. A listing SI will not automatically be done on these sites, however. First, they will go through a management evaluation to determine whether they can be addressed by another authority such as RCRA [Resource Conservation and Recovery Act].... Sites that are designated NFRAP or deferred to other statutes are not candidates for a listing SI.

The listing SI will address all the data requirements of the revised HRS using field screening and NPL level DQOs. It may also provide needed data in a format to support remedial investigation work plan development. Only sites that appear to score high enough for listing and that have not been deferred to another authority will receive a listing SI. (U.S. EPA 1988)

U.S. EPA Region V has also instructed FIT to identify sites during the SSI that may require removal action to remediate an immediate human health or environmental threat.

2. SITE BACKGROUND

2.1 INTRODUCTION

This section includes information from SSI work plan preparation, the site representative interview, and a reconnaissance inspection of the site.

2.2 SITE DESCRIPTION

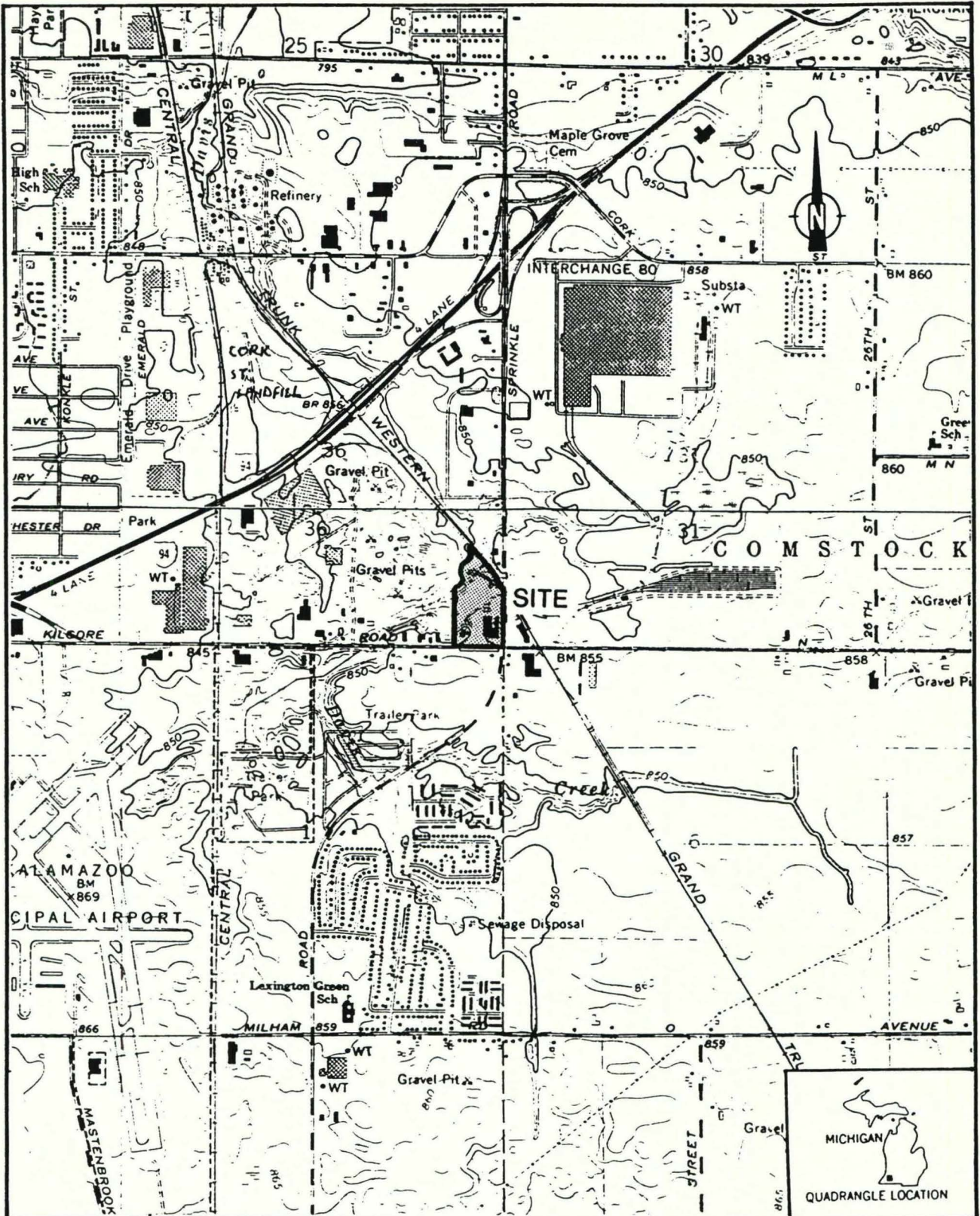
The KCRC site is an active county road commission maintenance, equipment, and office facility. During the months preceding January 1985, an unknown quantity of #10 nondetergent oil was released from the site into the surrounding environment (MDNR 1986).

The site is located on a parcel of land encompassing approximately 14.25 acres of land in an area of light to moderate industrial use and moderate population. The site is located in Kalamazoo, Michigan, in Kalamazoo County (SE1/4SE1/4SE1/4 sec. 36, T.2S., R.11W.) on East Kilgore Road (see Figure 2-1 for site location). A 4-mile radius map of the KCRC site is provided in Appendix A.

2.3 SITE HISTORY

The County of Kalamazoo has owned and operated the KCRC site property since approximately 1949. The site is an active facility that maintains vehicles and equipment, stores equipment, and houses offices for county roadway maintenance operations (Byrnes 1989).

In January 1985, an accidental release of an undetermined quantity of #10 nondetergent oil was discovered by county road commission employees. The oil was discovered to be leaking from a hoist system



SOURCE: Ecology and Environment, Inc. 1990; BASE MAPS: USGS, Kalamazoo, MI Quadrangle, 7.5 Minute Series, 1967; Portage, MI Quadrangle, 7.5 Minute Series, 1967.

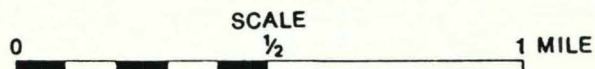


FIGURE 2-1 SITE LOCATION

within the equipment garage. The spill had apparently gone undetected for some time prior to its discovery (Wilkins & Wheaton 1986).

After the discovery, the apparent source of the leak was located and road commission officials revised the hydraulic system to prevent further oil escape. Kalamazoo County Road Commission officials then informed MDNR of the spill and, as a result, MDNR requested that the county perform a hydrogeologic investigation at the site (Wilkins & Wheaton 1986).

Subsequently, Wilkins & Wheaton Environmental, Incorporated (Wilkins & Wheaton), of Kalamazoo, Michigan, was contracted, and a hydrogeologic report was prepared in June 1986. Sampling of monitoring wells installed during the hydrogeologic investigation and sampling of soils and sediments adjacent to Davis-Olmstead County Drain (which runs through the northwest portion of the site) were performed by both Wilkins & Wheaton and MDNR. Sample analysis allegedly revealed compounds including trans-1,2-dichloroethene, trichloroethene, benzene, ethylbenzene, toluene, and total xylenes (MDNR 1986a).

Two excavations were voluntarily undertaken by KCRC at the site in an attempt to remove any remaining contaminated soils. One of these excavations occurred in the fall of 1985 and one in the summer of 1987 (Byrnes 1989). In both cases, Fulton Excavating was contracted for the removal and transport of contaminated soils to West Side Landfill of Three Rivers, Michigan, a Type II, lined landfill. The total volume of excavated soils is unknown, but may be estimated as the volume resulting from both a 1- to 2-foot-deep and a 10- to 12-foot-deep scrape over an area between 500 and 2,000 square feet (Byrnes 1989).

With the exception of the hydrogeological report and subsequent sampling, there have been no regulatory-related response activities at the KCRC site.

3. SCREENING SITE INSPECTION PROCEDURES AND FIELD OBSERVATIONS

3.1 INTRODUCTION

This section outlines procedures and observations of the SSI of the KCRC site. Individual subsections address the site representative interview, reconnaissance inspection, and sampling procedures. Rationales for specific FIT activities are also provided. The SSI was conducted in accordance with the U.S. EPA-approved work plan.

The U.S. EPA Potential Hazardous Waste Site Inspection Report (Form 2070-13) for the KCRC site is provided in Appendix B.

3.2 SITE REPRESENTATIVE INTERVIEW

Robert E. Slaughter, FIT team leader, conducted an interview with John Byrnes of the Kalamazoo County Road Commission; Bill French of Wilkens & Wheaton; Greg Patterson of Limno-Tech, Incorporated; and Bill Bouma of KAR Laboratories (which performed the analysis of Wilkens & Wheaton-collected soil, sediment, and monitoring well samples). The interview was conducted on July 25, 1989, at 8:15 a.m. in the road commission offices at 3801 East Kilgore Road, in Kalamazoo, Michigan. The interview was conducted to gather information that would aid FIT in conducting SSI activities.

3.3 RECONNAISSANCE INSPECTION

Following the site representative interview, FIT conducted a reconnaissance inspection of the KCRC site and surrounding area according to Ecology and Environment, Inc. (E & E), health and safety guidelines.

The reconnaissance inspection included a walk-through of the site to determine appropriate health and safety requirements for conducting on-site activities and to make observations to aid in characterizing the site. FIT also determined exact sampling locations during the reconnaissance inspection.

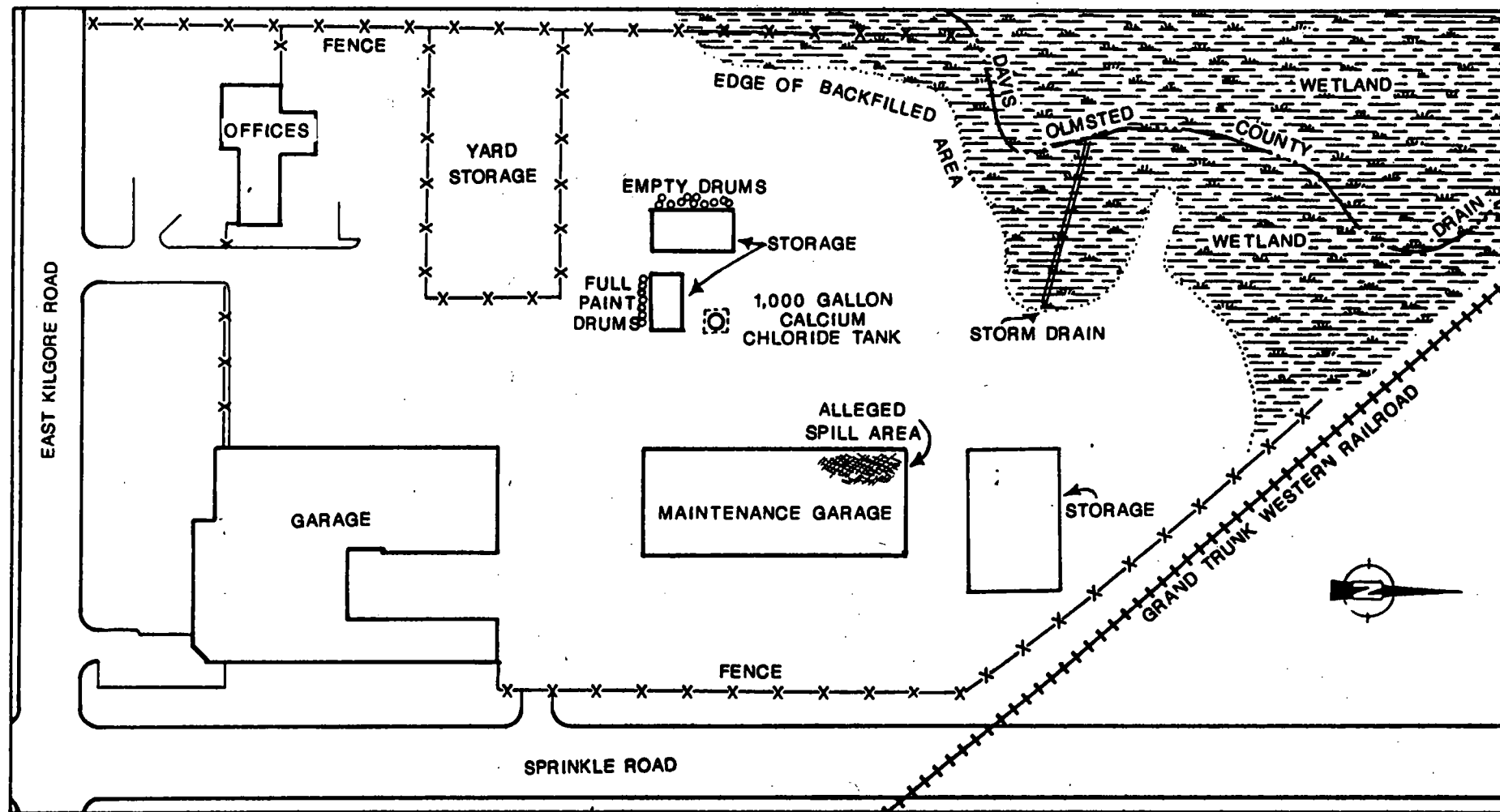
The reconnaissance inspection was begun at approximately 9:30 a.m. on July 25, 1989. FIT was accompanied by site representatives during the reconnaissance inspection.

Reconnaissance Inspection Observations. The KCRC site, which encompasses approximately 14.25 acres, is located on the northwest corner of East Kilgore and Sprinkle roads. Grand Trunk Western railroad lines run diagonally near the site, forming its northeastern border (see Figure 3-1 for locations of site features).

The site is accessed by a driveway that runs northward from East Kilgore Road. Approximately 75% of the site area is either paved or occupied by one of six site buildings. These buildings include an office building in the southwest portion of the site, two garages (one in the southeast and one in the east-central portion of the site), two storage buildings in the west-central part of the site, and a recently constructed storage barn at the northeast corner of the site. The northwest and north ends of the site are composed of wetlands. Some of the northwest portion of the site was backfilled in order to create more usable property for site operations. Davis-Olmstead County Drain meanders from southwest to northeast through the wetlands.

Other site features included a 1,000-gallon storage tank used to contain calcium chloride, located at the center of the site; a yard storage area where various operational implements are stored, located along the western border of the site; empty drums stored on their sides to the west of one of the west-central storage buildings; and approximately 100 barrels full of paint stored next to the other west-central storage building. The paint in these barrels was used to line roadways.

Land use in the vicinity of the site is primarily commercial and light industrial. A moderate residential population was observed to the north and west of the site and a more rural and agricultural concentration to the east and south.



SOURCE: Ecology and Environment, Inc. 1990.



FIGURE 3-1 SITE FEATURES

The site is bordered to the northeast by the Grand Trunk Western railroad tracks, to the east by Sprinkle Road, to the south by East Kilgore Road, and to the west by Peters Construction Company.

The site has a gradual slope from southeast to northwest, with a greater drop-off (of some 15 to 20 feet) along the backfilled area bordering the wetland. Surface topography in the site area consists of gently rolling hills. Vegetation away from the paved areas included deciduous trees, shrubs, grasses, reeds, and other herbaceous plants.

The site is fenced on the south, west, east, and northeast sides. Photographs of the KCRC site are provided in Appendix C.

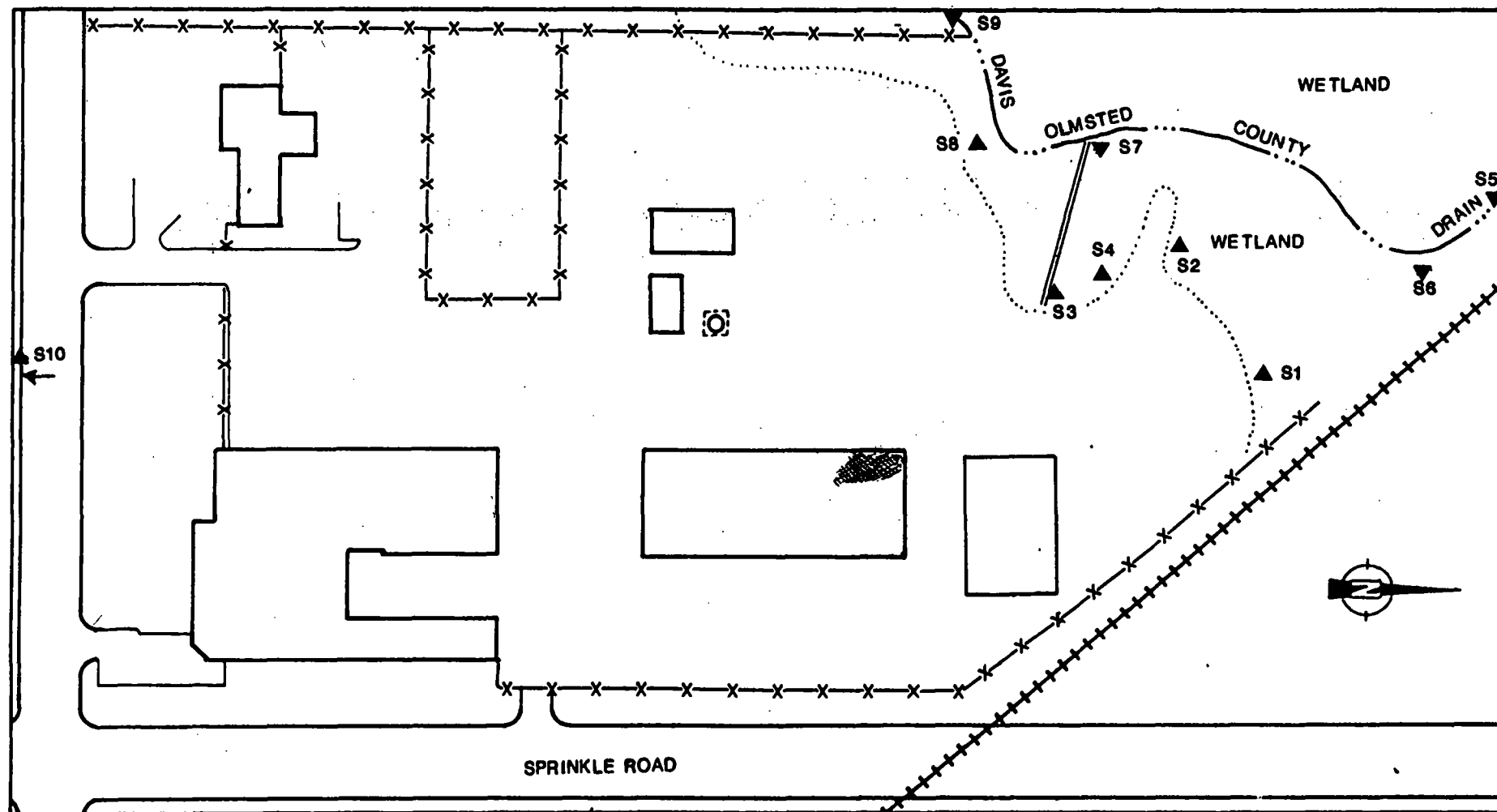
3.4 SAMPLING PROCEDURES

Soil and sediment samples were collected by FIT at locations chosen during the reconnaissance inspection to determine whether U.S. EPA Target Compound List (TCL) compounds or U.S. EPA Target Analytes List (TAL) analytes were present at the site. The TCL and TAL, with corresponding quantitation/detection limits, are provided in Appendix D.

On July 25, 1989, FIT collected six soil and four sediment samples, including a potential background soil sample. On July 26, 1989, FIT collected six monitoring well samples. Site representatives accepted offered portions of the FIT-collected samples.

Soil/Sediment Sampling Procedures. Five surface soil samples (S1, S2, S3, S4, and S8) were collected along the base of the rise created by backfilling operations in the northwest portion of the site, near the wetlands (see Figure 3-2 for soil/sediment sampling locations). These soil samples were collected to characterize wastes believed to be present at the site. FIT was unable to sample the exact area where the oil leak reportedly occurred because the alleged spill area was located beneath the maintenance garage in the east-central portion of the site.

Four sediment samples (S5, S6, S7, and S9) were collected by FIT along Davis-Olmstead County Drain, beginning downstream and concluding in an upstream potential background sample (S9). These sediment samples were collected to determine whether TCL compounds and/or TAL analytes had migrated to the drain and were being carried from the site via surface water.



SOURCE: Ecology and Environment, Inc. 1990.



- LEGEND
▲ SOIL SAMPLE
▼ SEDIMENT SAMPLE

FIGURE 3-2 SOIL/SEDIMENT SAMPLING LOCATIONS

Surface soil sample S10 was collected as a potential background soil sample approximately 120 feet south of East Kilgore Road. This location was chosen because it appeared to be undisturbed.

A garden trowel was used to obtain all soil samples at an approximate depth of 6 inches. All sediment samples were collected using a hand auger. The soil or sediment was transferred with a trowel into a stainless steel bowl, and sample bottles were then filled using the trowel (E & E 1987).

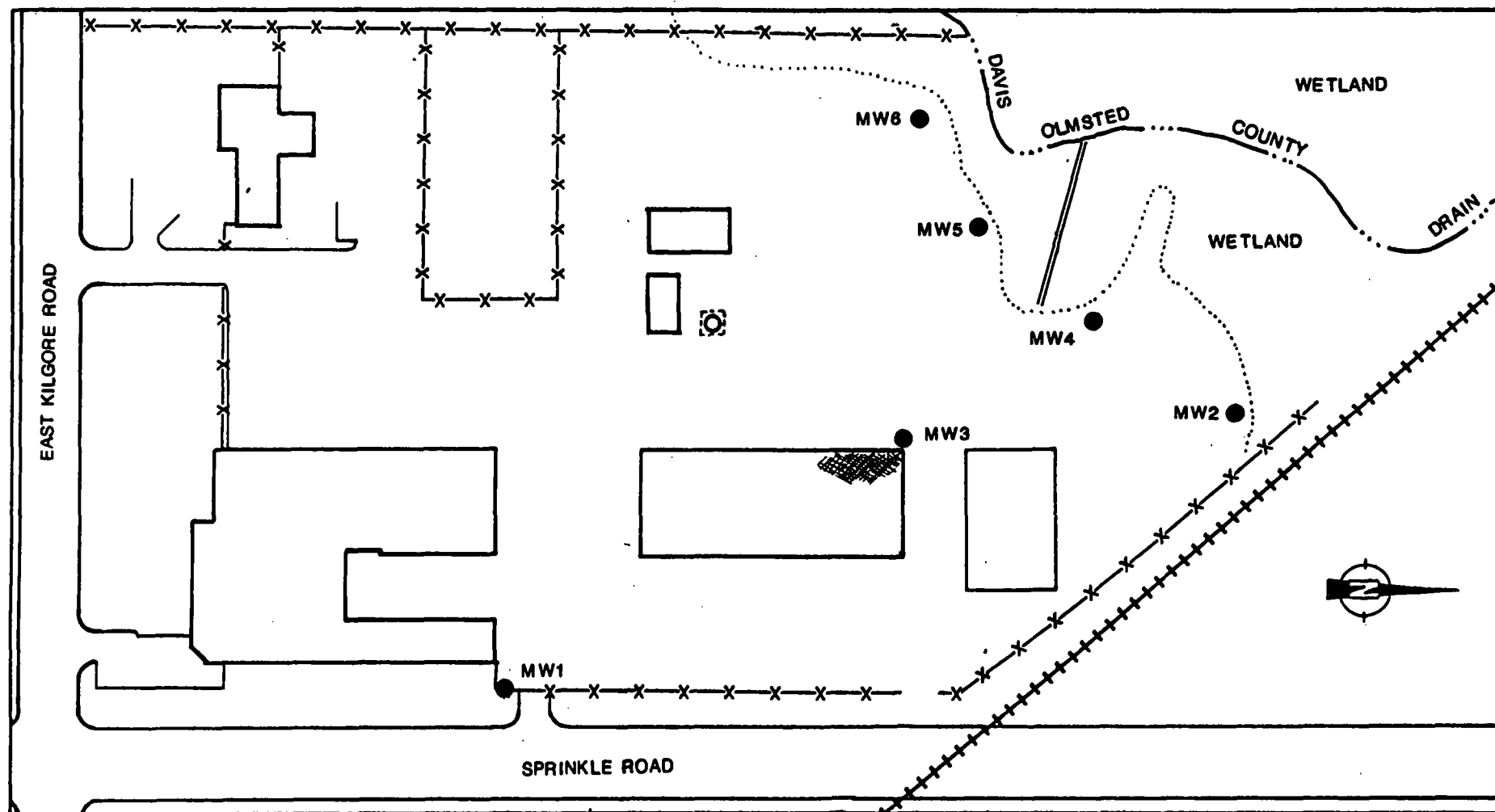
Standard E & E decontamination procedures were adhered to during the collection of all soil/sediment samples (E & E 1987). The procedures included the scrubbing of all equipment (e.g., auger, trowels, spoons, and bowls) with a solution of Alconox detergent and distilled water, and triple-rinsing the equipment with distilled water before the collection of each sample. All soil/sediment samples were packaged and shipped in accordance with U.S. EPA-required procedures.

As directed by U.S. EPA, all soil/sediment samples were analyzed under the U.S. EPA Contract Laboratory Program (CLP) for TCL compounds by Lancaster Laboratories of Lancaster, Pennsylvania, and for TAL analytes by Skinner & Sherman, Inc., of Waltham, Massachusetts.

Monitoring Well Sampling Procedures. FIT collected six monitoring well samples to determine the characteristics of groundwater at the site.

Monitoring well sample MW1 was collected as a potential upgradient groundwater sample (see Figure 3-3 for locations of the monitoring well samples). Monitoring well sample MW3 was collected from a well located adjacent to the alleged spill area. Monitoring well samples MW2, MW4, MW5, and MW6 were collected from wells located in areas determined to be potentially downgradient from the alleged waste source area. These samples were collected to determine whether a plume of potentially contaminated groundwater was emanating from the alleged waste source area.

A duplicate monitoring well sample was collected, in accordance with U.S. EPA quality assurance/quality control (QA/QC) requirements, from monitoring well MW1 (see Table 3-1 for monitoring well data).



SOURCE: Ecology and Environment, Inc. 1990.



FIGURE 3-3 MONITORING WELL SAMPLING LOCATIONS

Table 3-1

MONITORING WELL DATA

Well	Casing Elevation (feet above mean sea level)	Well Depth (feet)	Depth to Water (feet)	Volume Purged (gallons)	Water Elevation (feet above mean sea level) (7/26/89)	Well Volumes Purged
MW1	851.40	18.0	12.70	5	838.70	>5
MW2	841.10	17.0	6.16	9	834.94	>5
MW3	849.88	17.0	12.82	1.5 (Dry)	837.06	(Dry)
MW4	845.59	22.0	9.81	12	835.78	>5
MW5	845.20	30.5	11.39	16	833.81	>5
MW6	Unknown	24.0	9.37	12	Unknown	>5

Source: Ecology and Environment, Inc. 1990.

Available monitoring well logs are provided as an addendum to Appendix E. FIT also prepared a field blank using distilled water in accordance with U.S. EPA QA/QC requirements.

FIT obtained the monitoring well samples using 1 1/2-inch stainless steel bailers dedicated to each sample location. All monitoring well samples were packaged and shipped in accordance with U.S. EPA-required procedures.

Standard E & E decontamination procedures were adhered to during the collection of all monitoring well samples, including the duplicate and blank. The procedures included the scrubbing of all equipment (e.g., bailers) with a solution of Alconox detergent and distilled water, and triple-rinsing the equipment with distilled water before the collection of each sample (E & E 1987).

As directed by U.S. EPA, all monitoring well samples were analyzed under the U.S. EPA CLP for TCL compounds by Lancaster Laboratories of Lancaster, Pennsylvania, and for TAL analytes by Skinner & Sherman, Inc., of Waltham, Massachusetts.

4. ANALYTICAL RESULTS

4.1 INTRODUCTION

This section includes results of chemical analysis of FIT-collected soil/sediment samples and residential well samples for TCL compounds and TAL analytes.

4.2 RESULTS OF CHEMICAL ANALYSIS OF FIT-COLLECTED SAMPLES

Soil/Sediment Samples. Chemical analysis of FIT-collected soil/sediment samples revealed substances from the following groups of TCL compounds and TAL analytes: halogenated hydrocarbons, aromatics, phthalates, polycyclic aromatic hydrocarbons, pesticides, polychlorinated biphenyls (PCBs), metals, heavy metals, common laboratory artifacts, and common soil constituents (see Table 4-1 for complete soil/sediment sample chemical analysis results).

Monitoring Well Samples. Chemical analysis of FIT-collected monitoring well samples revealed substances from the following groups of TCL compounds and TAL analytes: phthalates, PCBs, metals, heavy metals, cyanide, common laboratory artifacts, and common soil constituents (see Table 4-2 for complete monitoring well sample chemical analysis results).

U.S. EPA CLP quantitation/detection limits used in the analysis of FIT-collected soil/sediment and monitoring well samples are provided in Appendix D. The analytical data for the chemical analysis of samples collected for this SSI have been reviewed by U.S. EPA and FIT for compliance with terms of the FIT contract, and the review has been approved

by U.S. EPA. Any additions, deletions, or changes to the data have been incorporated in the chemical analysis results tables presented in this section.

Table 4-1
RESULTS OF CHEMICAL ANALYSIS OF
FII-COLLECTED SOIL/SEDIMENT SAMPLES

Sample Collection Information and Parameters	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
Date	7/25/89	7/25/89	7/25/89	7/25/89	7/25/89	7/25/89	7/25/89	7/25/89	7/25/89	7/25/89
Time	1105	1110	1120	1125	1205	1220	1245	1255	1325	1410
CLP Organic Traffic Report Number	EFP35	EFP36	EFP37	EFP38	EFP39	EFP40	EFP41	EFP42	EFP43	EFP44
CLP Inorganic Traffic Report Number	NEEG91	NEEG92	NEEG93	NEEG94	NEEG95	NEEG96	NEEG97	NEEG98	NEEG99	NEEG91
Compound Detected (values in µg/kg)										
Volatile Organics										
ethylene chloride	--	2J	--	2J	--	2J	9	6	6	4J
acetone	--	--	--	--	--	--	--	--	11	--
2-butanone (MEK)	--	--	--	--	17J	--	--	--	--	--
benzene	--	--	--	--	--	--	--	3J	--	--
toluene	--	--	--	--	--	--	--	3J	--	--
chlorobenzene	--	--	--	5J	--	--	2J	--	--	--
xylene (total)	--	--	--	2J	--	--	--	2J	--	--
Semivolatile Organics										
benzoic acid	--	--	--	--	--	--	--	--	--	64J
diethylphthalate	--	--	--	--	--	--	59J	--	--	--
acenaphthene	86J	--	79J	73J	--	--	110J	--	--	88J
dibenzofuran	--	--	51J	--	--	--	67J	--	--	--
fluorene	--	--	100J	--	--	--	150J	--	--	59J
phenanthrene	790J	210J	1,500	760	1,300	--	1,400	150J	110J	2,300
anthracene	120J	--	190J	83J	220J	--	310J	--	--	--
fluoranthene	900J	300J	2,200	1,200	3,300	--	2,600	240J	280J	5,100
pyrene	1,700J	290J	2,000	850	2,200	--	1,900	200J	270J	5,300
butylbenzylphthalate	3,200J	--	--	--	110J	--	55J	300J	--	--
benzo[a]anthracene	550J	120J	790	350J	850J	--	770	96J	110J	1,600
chrysene	560J	150J	980	460	1,200	--	940	150J	140J	4,900
bis(2-ethylhexyl)phthalate	3,200J	--	--	180J	760J	--	580	44J	--	160J
di-n-octylphthalate	--	--	--	--	--	--	--	190J	--	--
benzo[b]fluoranthene	410J	120J	880	390J	1,200	--	790	110J	100J	5,000
benzo[k]fluoranthene	--	100J	750	--	1,000	--	620	110J	99J	4,000
benzo[a]pyrene	--	96J	750	340J	930	--	670	100J	96J	3,300
indeno[1,2,3-cd]pyrene	--	--	450	150J	590J	--	400J	--	--	3,400
dibenzo[a,h]anthracene	--	--	--	--	--	--	--	--	--	850
benzo[g,h,i]perylene	--	--	530	180J	700J	--	440	--	--	3,600
Pesticides/PCBs										
4,4'-DDE	37	--	--	--	--	--	--	--	--	--
Endrin ketone	--	--	10J	--	--	--	--	--	--	83
Aroclor 1254	--	--	40J	--	--	900J	--	--	--	--

Table 4-1 (Cont.)

Sample Collection Information and Parameters	Sample Number									
	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
<u>Analyte Detected</u> (values in mg/kg)										
aluminum	4,150	8,760	2,870	2,810	6,740	5,050	4,430	2,630	2,710	11,000
antimony	--	9.1JNB	--	--	28.4JNB	--	8.9NB	--	--	--
arsenic	5.8	5.3	4.6	8.2	46.2	57.6	4.0	11.9	6.3	14.3
barium	61.7	63.6	20.8B	57.9	144	88.1B	36.8B	18.3B	18.2B	95.4
beryllium	--	--	--	--	--	--	0.58B	--	--	--
cadmium	--	--	--	--	39.7	9.6	0.81B	--	--	--
calcium	26,800	23,300	18,700	45,400	18,700	29,100	29,700	40,900	38,700	5,100
chromium	10.3	13.5	5.0	9.6	14.7	10.2	6.1	4.2	7.7	17.1
cobalt	4.0B	7.9B	2.6B	3.1B	8.5B	6.7B	2.6B	2.7B	3.2B	10B
copper	26.6	12.7	6.7	8.1	35.7	30	6.1	8.7	6.3B	24
iron	22,300	14,500	9,090	14,600	22,300	20,300	8,160	12,300	9,940	22,900
lead	284	40.2	25.5	24	93.3	117	14.5	34.9	32.5	75.8
magnesium	7,620	5,670	5,970	13,400	5,170	6,460	6,630	15,000	12,900	3,500
manganese	460	605	219	567	475	514	458	249	186	1,070
mercury	--	0.21	--	--	--	--	--	--	--	--
nickel	11	14.2	6.2B	5.2B	15.4B	7.6B	6.1B	5.0B	7.3B	20.5
potassium	338B	598B	268B	311B	553B	486B	298B	269B	172B	769B
selenium	--	--	--	--	1.0JNB	0.85JNB	--	--	--	--
sodium	375B	114B	57.1B	1,590	219B	142B	162B	1,430	74.1B	172B
vanadium	19.9	21.4	9.4B	8.9B	21.5B	13.3B	8.9B	10B	10.1B	28.5
zinc	205	85.6	41.9	42.5	263	149	50.1	28.8	33.3	111

-- Not detected.

Table 4-1 (Cont.)

COMPOUND QUALIFIERS

DEFINITION

INTERPRETATION

J

Indicates an estimated value.

Compound value may be semiquantitative.

ANALYTE QUALIFIERS

DEFINITION

INTERPRETATION

N

Spike recoveries outside QC protocols, which indicates a possible matrix problem. Data may be biased high or low. See spike results and laboratory narrative.

Value may be quantitative or semiquantitative.

B

Value is real, but is above instrument DL and below CRDL.

Value may be quantitative or semiquantitative.

J

Value is above CRDL and is an estimated value because of a QC protocol.

Value may be semiquantitative.

Source: Ecology and Environment, Inc. 1990.

Table 4-2
RESULTS OF CHEMICAL ANALYSIS OF
FIT-COLLECTED MONITORING WELL SAMPLES

Sample Collection Information and Parameters	MW1	MW2	MW3	MW4	MW5	MW6	Duplicate	Blank
Date	7/26/89	7/26/89	7/26/89	7/26/89	7/26/89	7/26/89	7/26/89	7/26/89
Time	0945	0940	1100	1115	1145	1200	0945	0900
CLP Organic Traffic Report Number	EFP45	EFP47	EFP48	EFP49	EFP50	EFP51	EFP46	EFP52
CLP Inorganic Traffic Report Number	NEED92	NEED94	NEED95	NEED96	NEED97	NEED98	NEED93	NEED99
Temperature (°C)	18	16	23	22	24	25	18	26
Specific Conductivity (µmhos/cm)	500	1100	1400	1100	1700	500	500	4
pH	7.41	7.34	8.63	7.39	7.36	7.61	7.41	6.54
<u>Compound Detected</u> (values in µg/L)								
<u>Volatile Organics</u>								
1,2-dichloroethane	--	--	--	--	--	--	--	21
<u>Semivolatile Organics</u>								
bis(2-ethylhexyl)phthalate	11	--	--	--	56	--	--	--
<u>Pesticides/PCBs</u>								
Aroclor 1254	--	--	--	--	--	0.53	--	--
<u>Analyte Detected</u> (values in µg/L)								
aluminum	47.2JB	--	--	--	1,350	88.1JB	43.5JB	39.8JB
antimony	--	--	--	--	--	--	--	32.8JB
arsenic	2.1B	1.4B	3.5B	--	4.4JB	3.6JB	--	--
barium	47.2B	42.9B	35.2B	49.6B	96.3B	45.8B	49.1B	--
calcium	86,200	78,700	22,800	79,400	123,000	86,300	88,000	276B
cobalt	--	--	--	--	7.3JB	--	--	--
copper	6.2JB	4.3JB	--	8.6JB	14.5JB	11.7JB	7.4JB	17.8JB
iron	--	16.7B	--	8.8B	7,520	105	8.3B	--
lead	--	--	--	--	4.3JB	6.8JB	3.9JB	--
magnesium	21,500	15,500	18,100	18,600	27,600	24,200	21,900	--
manganese	30.2	2.7JB	14.4B	3.6JB	58.9	203	29.2	1.8B
potassium	2,890B	1,670B	5,630	2,080B	3,110B	2,840B	2,840B	--
selenium	2.9JB	--	--	--	--	--	--	--
sodium	27,300	155,000	281,000	127,000	248,000	31,600	27,700	613B
zinc	593	477	70.8J	311	810	2,220	573	27.6J
cyanide	--	12.6	--	--	--	--	--	--

-- Not detected.

Table 4-2 (Cont.)

COMPOUND QUALIFIER

DEFINITION

INTERPRETATION

J

Indicates an estimated value.

Compound value may be semiquantitative.

ANALYTE QUALIFIERS

DEFINITION

INTERPRETATION

N

Spike recoveries outside GC protocols, which indicates a possible matrix problem. Data may be biased high or low. See spike results and laboratory narrative.

Value may be quantitative or semi-quantitative.

B

Value is real, but is above instrument DL and below CRDL.

Value may be quantitative or semi-quantitative.

J

Value is above CRDL and is an estimated value because of a GC protocol.

Value may be semiquantitative.

W

Post-digestion spike for furnace AA analysis is out of control limits (35-115%), while sample absorbance is <50% of spike absorbance.

Value may be semiquantitative.

Source: Ecology and Environment, Inc. 1990.

5. DISCUSSION OF MIGRATION PATHWAYS

5.1 INTRODUCTION

This section contains a discussion of data and information that apply to potential migration pathways and targets of TCL compounds and/or TAL analytes that may be attributable to the KCRC site.

The five migration pathways of concern discussed are groundwater, surface water, air, fire and explosion, and direct contact.

5.2 GROUNDWATER

Substances detected at the highest concentrations in FIT-collected monitoring well samples included the TCL compound Aroclor 1254 (0.5 µg/L) and the TAL analytes aluminum (1,350 µg/L), arsenic (4.4 µg/L), barium (96.3 µg/L), cobalt (7.3 µg/L), iron (7,520 µg/L), lead (6.8 µg/L), selenium (2.9 µg/L), zinc (2,220 µg/L), and cyanide (12.6 µg/L).

This compound and these analytes may be attributable to the KCRC site, based on the following information.

- The TCL compound Aroclor 1254, a PCB, was detected in a potentially downgradient monitoring well sample and in FIT-collected soil/sediment samples.
- The TAL analytes aluminum, cobalt, iron, lead, and cyanide were detected in monitoring well samples at concentrations greater than those detected in the potential upgradient monitoring well sample. Based on comparison with levels detected in FIT-collected soil/sediment samples, all TAL

analytes except cyanide appear to be naturally occurring soil constituents. Cyanide therefore may be attributable to the KCRC site.

TCL compounds, including benzene (3 µg/kg), chlorobenzene (5 µg/kg), total xylenes (2 µg/kg), dimethylphthalate (59 µg/kg), dibenzofuran (67 µg/kg), anthracene (310 µg/kg), 4,4'-DDD (37 µg/kg), and Aroclor 1254 (900 µg/kg); and TAL analytes, including antimony (28.4 mg/kg), beryllium (0.58 mg/kg), cadmium (39.7 mg/kg), mercury (0.21 mg/kg), and selenium (1.0 mg/kg), were detected in FIT-collected on-site soil/sediment samples. These TCL compounds and TAL analytes were detected either at levels exceeding concentrations detected in potential background soil/sediment samples by greater than 10 times, or were not detected in potential background soil/sediment samples. These substances therefore do not appear to be naturally occurring soil constituents.

The potential exists for these TCL compounds and TAL analytes to migrate to groundwater in the vicinity of the KCRC site, based on the following geological information.

- The two dominant glacial/fluviol land formations in the site area are the alluvium stream and sediment deposits associated with Kalamazoo River Valley, which consist of sorted or unsorted sands, gravels, clays, and silts; and the glacially derived outwash plain deposits, which consist predominantly of sand and gravel associated with the recession of glaciers of the Wisconsin glacial period (Western Michigan University 1981).
- Based on information from monitoring well logs, materials located directly beneath the site are glacially derived. Drift thickness in the area ranges between 100 and 200 feet (Western Michigan University 1981).

- This glacial drift overlies the Mississippian Coldwater shale bedrock of the Paleozoic era, made up of layers of gray shales (Western Michigan University 1981).
- Logs of wells in the area (provided in Appendix E) indicate that, within the 3-mile radius, private and municipal wells draw drinking water from the glacial drift aquifer at depths ranging from 30 to 197 feet. The glacial drift aquifer is the aquifer of concern in the site area.

Based on monitoring well measurements and area topography, local groundwater flow is assumed to be to the northwest, toward Davis-Olmstead County Drain. The deeper regional flow direction may be more northerly, toward the Kalamazoo River.

The nearest drinking water well is located approximately 1,000 feet east of the site. The depth to the aquifer of concern in the area is approximately 4 feet.

The potential targets of groundwater contamination include approximately 87,235 persons who 1) reside within a 3-mile radius of the site and draw drinking water from private wells finished in the aquifer of concern, or 2) are served by the Kalamazoo municipal water system or Becker well field #13 to the west of the site, both of which draw water from wells finished in the aquifer of concern within a 3-mile radius of the site.

The city of Portage, Michigan, located to the southwest of the site, operates its own municipal water system. Its wells are situated outside of the 3-mile radius (United States Geological Survey [USGS] 1961, 1967, 1982).

The Kalamazoo municipal water system serves approximately 79,722 persons (U.S. Bureau of the Census 1982; MDPH 1987). The population served by private wells within the 3-mile radius was calculated by counting houses on USGS topographic maps of the site area (USGS 1961, 1967, 1982) and multiplying the resulting house count by the Kalamazoo County 1980 Census average of 2.67 persons per household (U.S. Bureau of the Census 1982). By adding the 79,722 persons served by the Kalamazoo

municipal water system to the approximately 7,513 persons served by private wells within the 3-mile radius, a total groundwater target population of approximately 87,235 persons can be calculated.

5.3 SURFACE WATER

Sediment samples S5, S6, S7, and S9 were collected from the bottom of Davis-Olmstead County Drain. These samples contained elevated levels of TCL compounds and TAL analytes. Davis-Olmstead County Drain feeds the Kalamazoo River approximately 3.5 miles downstream from the site. The drain is not used for drinking water or for recreation. However, FIT observed that the Kalamazoo River is used recreationally.

It is not known whether TCL compounds and/or TAL analytes have migrated from the site via Davis-Olmstead County Drain because extensive downstream sediment/surface water sampling was not performed by FIT during the SSI.

5.4 AIR

A release of potential contaminants to the air was not documented by FIT during SSI activities at the KCRC site. During the reconnaissance inspection, FIT site-entry equipment (HNU 101, radiation monitor, colorimetric monitoring tubes for hydrogen cyanide), did not detect levels above background concentrations at the site (E & E 1987). In accordance with the U.S. EPA-approved work plan, further air monitoring was not performed by FIT.

A potential does exist for TCL compounds and TAL analytes detected in on-site soils to be carried off-site by windblown particulates. Based on house counts from USGS topographic maps (USGS 1961, 1967, 1982) multiplied by the Kalamazoo County persons-per-household average of 2.67 (U.S. Bureau of the Census 1982) and on planimeter scale readings, the population within a 4-mile radius of the KCRC site is approximately 44,551 persons.

5.5 FIRE AND EXPLOSION

File information did not indicate a danger of fire or explosion at the KCRC site. FIT observations and explosimeter readings indicated no apparent potential for fire or explosion at the site.

5.6 DIRECT CONTACT

There is no documentation of an incident involving direct contact with, or exposure to, TCL compounds and TAL analytes present in surface soils at the site. However, a potential does exist for the public to come into direct contact with TCL compounds and TAL analytes detected at the site, based on the following information.

- TCL compounds and TAL analytes have been detected in on-site surface soils.
- Access to the site is not completely restricted.
- The north end (wetland portion) of the site may be used recreationally (Byrnes 1989).

The direct contact target population includes approximately 1,020 persons who reside within a 1-mile radius of the KCRC site. This population was calculated using house counts from USGS topographic maps of the site area (USGS 1961, 1967, 1982) multiplied by the 1980 Kalamazoo County Census average of 2.67 persons per household.

6. REFERENCES

Byrnes, John C., July 25, 1989, Safety Director, Kalamazoo County Road Commission, interview, conducted by Robert Slaughter of E & E.

E & E, 1987, Quality Assurance Project Plan Region V FIT Conducted Site Inspections, Chicago, Illinois.

MDNR, July 23, 1986, Site Description/Executive Summary, for the KCRC site, U.S. EPA ID: MID020899647, prepared by J. Rodin and C. Wallace, Lansing, Michigan.

_____, October 10, 1986a, Environmental Laboratory Summary of Analysis, for samples collected from the KCRC site, by Sue Schweikart and Frank Ball, Lansing, Michigan.

MDPH, July 21, 1987, Community Public Water Supply Summary Report.

U.S. Bureau of the Census, 1982, 1980 Census of Population, Volume I, General Population Characteristics, Michigan, Washington, D.C.

U.S. EPA, February 12, 1988, Office of Solid Waste and Emergency Response, Pre-Remedial Strategy for Implementing SARA, Directive number 9345.2-01, Washington, D.C.

USGS, 1961, Galesburg, photorevised 1985; 1967, Kalamazoo, photorevised 1973; 1967, Portage, photorevised 1973; and 1982, Adams Park, Michigan Quadrangles, 7.5 Minute Series: 1:24,000.

Western Michigan University, 1981, Hydrogeologic Map of Michigan.

Wilkens & Wheaton, June 1986, Hydrogeologic Report for KCRC Site, Kalamazoo, Michigan.

4175:6

APPENDIX A

SITE 4-MILE RADIUS MAP



ecology and environment, inc.		KALAMAZOO COUNTY RD. COMMISSION	
USGS TOPOGRAPHIC MAP:		U.S. EPA ID# M-202089947	
NAME KALAMAZOO		NAME GALESBURG	
DATE 1967		DATE 1961	
REVISED 1973		REVISED 1985	
NAME PORTAGE		NAME ADAMS PARK	
DATE 1967		DATE 1982	
REVISED 1973		REVISED	
SCALE 0 1/2 1 MILE		QUADRANGLE LOCATION	

— KALAMAZOO MUNICIPAL WATER SUPPLY BOUNDARY
— PORTAGE " " BOUNDARY
— DAVIS CREEK DOWNSTREAM TO KALAMAZOO R.

APPENDIX B

U.S. EPA FORM 2070-13



POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION

01 STATE 02 SITE NUMBER
MI D020899647

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site) KALAMAZOO COUNTY RD. COMM.		02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER 3801 E. KILGORE RD.			
03 CITY KALAMAZOO	04 STATE MI	05 ZIP CODE 49007	06 COUNTY KALAMAZOO	07 COUNTY CODE 39	08 CONG DIST 03
09 COORDINATES LATITUDE 42° 14' 42.0" LONGITUDE 085° 31' 52.0"		10 TYPE OF OWNERSHIP (Check one) <input type="checkbox"/> A. PRIVATE <input type="checkbox"/> B. FEDERAL <input type="checkbox"/> C. STATE <input checked="" type="checkbox"/> D. COUNTY <input type="checkbox"/> E. MUNICIPAL <input type="checkbox"/> F. OTHER <input type="checkbox"/> G. UNKNOWN			

III. INSPECTION INFORMATION

01 DATE OF INSPECTION 7.25.89 MONTH DAY YEAR	02 SITE STATUS <input checked="" type="checkbox"/> ACTIVE <input type="checkbox"/> INACTIVE	03 YEARS OF OPERATION 1949 PRESENT BEGINNING YEAR ENDING YEAR	UNKNOWN
04 AGENCY PERFORMING INSPECTION (Check all that apply) <input type="checkbox"/> A. EPA <input checked="" type="checkbox"/> B. EPA CONTRACTOR EKOLOGY ENVIRONMENTAL <input type="checkbox"/> C. MUNICIPAL <input type="checkbox"/> D. MUNICIPAL CONTRACTOR <input type="checkbox"/> E. STATE <input type="checkbox"/> F. STATE CONTRACTOR <input type="checkbox"/> G. OTHER			

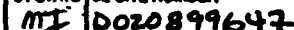
06 CHIEF INSPECTOR ROBERT E. SLAUGHTER	08 TITLE ENVIRONMENTAL SPECIALIST	07 ORGANIZATION E&E, INC.	09 TELEPHONE NO. (312) 663-9415
09 OTHER INSPECTORS STEVE BUNSEN	10 TITLE BIOLOGIST	11 ORGANIZATION E&E, INC.	12 TELEPHONE NO. (312) 663-9415
CINDY SCHULTZ	ENV. HEALTH SPECIALIST	E&E, INC.	(312) 663-9415
RAY WHITLOCK	CHEMIST	E&E, INC.	(312) 663-9415
RANDY LIVINGSTON	GEOGRAPHER	E&E, INC.	(312) 663-9415
			()

13 SITE REPRESENTATIVES INTERVIEWED JOHN C. BYRNES	14 TITLE SAFETY DIRECTOR	15 ADDRESS 3801 E. KILGORE RD. Kalamazoo, MI	16 TELEPHONE NO. (616) 381-3171
GREGORY W. PETERSON	L.T.I., INC. ENV. ENG.	2345 HURON PKWY. ANN ARBOR, MI 48104	(313) 973-8320
BILL BOUMA	KAR LABS, INC. PRESIDENT	4425 MANCHESTER KALAMAZOO, MI 49002	(616) 381-9666
BILL FRENCH	HYDRO GEOLOGIST	UNITED ENV. TECH., INC. 3308 OAKLAND, Kalamazoo, MI 49008	(616) 349-7024
			()
			()
			()

17 ACCESS GAINED BY (Check one) <input checked="" type="checkbox"/> PERMISSION <input type="checkbox"/> WARRANT	18 TIME OF INSPECTION 0815	19 WEATHER CONDITIONS 7/25 - CLOUDY, RAIN - 90'S 7/26 - CLOUDY, HUMID - 90'S
--	-------------------------------	--

IV. INFORMATION AVAILABLE FROM

01 CONTACT DON JOSEF	02 OF (Agency/Organization) USEPA REGION I CHICAGO, IL.	03 TELEPHONE NO. (312) 882-0393
04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM ROBERT E. SLAUGHTER	05 AGENCY USEPA	06 ORGANIZATION FIT II
	07 TELEPHONE NO. (312) 663-9415	08 DATE 10.31.89 MONTH DAY YEAR



EPA FORM 2070-13(7-81)



POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE ME 02 SITE NUMBER 15020899647

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 87235 04 NARRATIVE DESCRIPTION

SEE SECTION 5.2 IN NARRATIVE

01 ☒ B. SURFACE WATER CONTAMINATION 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 7970 04 NARRATIVE DESCRIPTION

SEE SECTION 5.3 IN NARRATIVE

01 ☐ C. CONTAMINATION OF AIR 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

SEE SECTION 5.4 IN NARRATIVE.

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

SEE SECTION 5.5 IN NARRATIVE

01 ☒ E. DIRECT CONTACT 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 1020 04 NARRATIVE DESCRIPTION

SEE SECTION 5.6 IN NARRATIVE

01 ☒ F. CONTAMINATION OF SOIL 02 ☒ OBSERVED (DATE: 7.25.89) ☐ POTENTIAL ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: 14.25 04 NARRATIVE DESCRIPTION
(Acres)

SEE SECTION 4.1 IN NARRATIVE

01 ☒ G. DRINKING WATER CONTAMINATION 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 87235 04 NARRATIVE DESCRIPTION

SEE SECTION 5.2 IN NARRATIVE

01 ☐ H. WORKER EXPOSURE/INJURY 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

THERE IS NO HISTORY OF WORKER EXPOSURE/INJURY DOCUMENTED AT THIS SITE.

01 ☒ I. POPULATION EXPOSURE/INJURY 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 87235 04 NARRATIVE DESCRIPTION

THERE IS NO HISTORY OF POPULATION EXPOSURE/INJURY AT THIS SITE. TCL COMPOUNDS AND/OR TCL ANIONTES DISCOVERED IN SOIL/SEDIMENT/GROUNDWATER SAMPLES MAY BE CONTACTED BY THE LOCAL POPULACE.



POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE 02 SITE NUMBER
MI 0020899647

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☒ J. DAMAGE TO FLORA
04 NARRATIVE DESCRIPTION

02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED

A POTENTIAL EXISTS FOR FLORA TO BE DAMAGED BY TCL COMPOUNDS AND/OR TAL ANALYTES FOUND IN FIT COLLECTED SAMPLES.

01 ☒ K. DAMAGE TO FAUNA
04 NARRATIVE DESCRIPTION (include name(s) of species)

02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED

THE POTENTIAL EXISTS FOR FAUNA TO CONTACT, INGEST AND/OR BIOACCUMULATE TCL COMPOUNDS AND/OR TAL ANALYTES FOUND TO BE PRESENT ON-SITE.

01 ☒ L. CONTAMINATION OF FOOD CHAIN
04 NARRATIVE DESCRIPTION

02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED

NO CONTAMINATION OF THE FOOD CHAIN WAS OBSERVED BY FIT. A POTENTIAL EXISTS FOR THE BIOACCUMULATION OF TCL COMPOUNDS AND/OR TAL ANALYTES BY AREA PRIMARY CONSUMERS.

01 ☒ M. UNSTABLE CONTAINMENT OF WASTES
(Spills/Leaks/Standing Liquids, Leaking drums)

02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☒ ALLEGED

03 POPULATION POTENTIALLY AFFECTED: 87235

04 NARRATIVE DESCRIPTION

SEE SECTIONS 2.3, 5.2, 5.3, AND 5.6 IN NARRATIVE.

01 ☒ N. DAMAGE TO OFFSITE PROPERTY
04 NARRATIVE DESCRIPTION

02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED

SEE SECTIONS 5.2, 5.3, AND 5.6 IN NARRATIVE.

01 ☒ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs
04 NARRATIVE DESCRIPTION

02 ☐ OBSERVED (DATE: _____); ☒ POTENTIAL ☐ ALLEGED

SEE SECTION 5.3 IN NARRATIVE.

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING
04 NARRATIVE DESCRIPTION

02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED

THERE IS NO HISTORY OF ILLEGAL/UNAUTHORIZED DUMPING AT THIS SITE.

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

NONE

III. TOTAL POPULATION POTENTIALLY AFFECTED: 87235

IV. COMMENTS

NONE.

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

FIT SITE INSPECTION - JULY 25-26, 1989
MDNR - FILES
FIT - FILES



POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION

01 STATE **MI** 02 SITE NUMBER **D020899647**

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
<input type="checkbox"/> A. NPDES				
<input type="checkbox"/> B. UIC				
<input type="checkbox"/> C. AIR				
<input type="checkbox"/> D. RCRA				
<input type="checkbox"/> E. RCRA INTERIM STATUS				
<input type="checkbox"/> F. SPCC PLAN				
<input type="checkbox"/> G. STATE (Specify)				
<input type="checkbox"/> H. LOCAL (Specify)				
<input type="checkbox"/> I. OTHER (Specify)				
<input checked="" type="checkbox"/> J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE	04 TREATMENT (Check all that apply)	05 OTHER
<input type="checkbox"/> A. SURFACE IMPOUNDMENT			NONE	
<input type="checkbox"/> B. PILES			<input type="checkbox"/> A. INCINERATION	<input checked="" type="checkbox"/> A. BUILDINGS ON SITE
<input checked="" type="checkbox"/> C. DRUMS, ABOVE GROUND	N 5500	GALS.	<input type="checkbox"/> B. UNDERGROUND INJECTION	SEVERAL.
<input checked="" type="checkbox"/> D. TANK, ABOVE GROUND	N 1000	GALS.	<input type="checkbox"/> C. CHEMICAL/PHYSICAL	
<input type="checkbox"/> E. TANK, BELOW GROUND			<input type="checkbox"/> D. BIOLOGICAL	
<input type="checkbox"/> F. LANDFILL			<input type="checkbox"/> E. WASTE OIL PROCESSING	
<input type="checkbox"/> G. LANDFARM			<input type="checkbox"/> F. SOLVENT RECOVERY	
<input type="checkbox"/> H. OPEN DUMP			<input type="checkbox"/> G. OTHER RECYCLING/RECOVERY	
<input checked="" type="checkbox"/> I. OTHER SPILL #10 OIL UNKNOWN (N 800 GALS.)			<input type="checkbox"/> H. OTHER (Specify)	N 14.25 (None)

07 COMMENTS

NONE.

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)
<input type="checkbox"/> A. ADEQUATE, SECURE <input checked="" type="checkbox"/> B. MODERATE <input type="checkbox"/> C. INADEQUATE, POOR <input type="checkbox"/> D. INSECURE, UNSOUND, DANGEROUS
02 DESCRIPTION OF DRUMS, DIBING, LINERS, BARRIERS, ETC. N 100 DRUMS OF ROADWAY PAINT ARE STORED WITHOUT SECONDARY CONTAINMENT. A 1000 GALLON TANK OF CALCIUM CHLORIDE IS SURROUNDED COMPLETELY BY A CEMENT DIKE. FT OBSERVED N 2 FEET OF H₂O INSIDE THIS DIKE.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
02 COMMENTS SEE SECTION 5.6 OF REPORT.

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

FT SITE INSPECTION - JULY 25-26, 1989 MANR FILES FT FILES
--



POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE 02 SITE NUMBER

MI D020899647

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY
(Check as applicable)

SURFACE

WELL

COMMUNITY

A. ☐

B. ☒

NON-COMMUNITY

C. ☐

D. ☐

02 STATUS

ENDANGERED

AFFECTED

MONITORED

A. ☐

B. ☐

C. ☒

D. ☐

E. ☐

F. ☐

03 DISTANCE TO SITE

A. ~1 (mi)

B. ~1000 FT (m)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☒ A. ONLY SOURCE FOR DRINKING

☐ B. DRINKING

(Other sources available)

COMMERCIAL, INDUSTRIAL, IRRIGATION

(No other water sources available)

☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION

(Listed other sources available)

☐ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER

87235

03 DISTANCE TO NEAREST DRINKING WATER WELL ~1000 FT (m)

04 DEPTH TO GROUNDWATER

4 (m)

05 DIRECTION OF GROUNDWATER FLOW

N NORTHWEST

06 DEPTH TO AQUIFER
OF CONCERN

4 (m)

07 POTENTIAL YIELD
OF AQUIFER

~86400 (gpd)

08 SOLE SOURCE AQUIFER

☐ YES ☒ NO

09 DESCRIPTION OF WELLS (including crease, depth, and location relative to population and buildings)

WELLS THROUGHOUT THE SITE REGION ARE USED FOR DRINKING WATER, RANGE IN DEPTHS OF FROM 20 - 197 FEET AND ARE BOTH FOR PRIVATE AND MUNICIPAL USE.

10 RECHARGE AREA

☒ YES

☐ NO

COMMENTS SAND AND GRAVEL DRIFT PROVIDE GOOD AREA RECHARGE

11 DISCHARGE AREA

☐ YES

☐ NO

COMMENTS DAVIS CREEK AND THE KALAMAZOO RIVER ARE POTENTIAL DISCHARGE AREAS.

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☒ A. RESERVOIR/RECREATION
DRINKING WATER SOURCE

☐ B. IRRIGATION, ECONOMICALLY
IMPORTANT RESOURCES

☐ C. COMMERCIAL, INDUSTRIAL

☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:

AFFECTED

DISTANCE TO SITE

DAVIS CREEK

☐

ON-SITE (mi)

PORTAGE CREEK

☐

2 (mi)

KALAMAZOO RIVER

☐

2.5 (mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE

A. 1020

NO. OF PERSONS

TWO (2) MILES OF SITE

B. 7970

NO. OF PERSONS

THREE (3) MILES OF SITE

C. 22559

NO. OF PERSONS

02 DISTANCE TO NEAREST POPULATION

1/5 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE

~2985

04 DISTANCE TO NEAREST OFF-SITE BUILDING

300 FT (m)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

THE SITE LIES IN AN AREA OF MODERATE SUBURBAN POPULATION DENSITY 1 TO 4 MILES AND ONE OF SPARSELY POPULATED LIGHT INDUSTRIAL USE 0-1 MILES.



POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE MI 02 SITE NUMBER D020899647

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-8} - 10^{-6}$ cm/sec ☐ B. $10^{-4} - 10^{-6}$ cm/sec ☒ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☒ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ☐ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-6}$ cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK

~ 200 (ft)

04 DEPTH OF CONTAMINATED SOIL ZONE

UNKNOWN (ft)

05 SOIL pH

UNKNOWN

06 NET PRECIPITATION

~ 3.0 (in)

07 ONE YEAR 24 HOUR RAINFALL

2.25 (in)

08 SLOPE

SITE SLOPE

3-5 %

DIRECTION OF SITE SLOPE

NORTH

TERRAIN AVERAGE SLOPE

1-3 %

09 FLOOD POTENTIAL

SITE IS IN UNK. YEAR FLOODPLAIN

10

N/A

☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE

OTHER

A. N/A (mi)

B. ON-SITE (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

> 1 (mi)

ENDANGERED SPECIES: NONE

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL

RESIDENTIAL AREAS; NATIONAL/STATE PARKS,
FORESTS, OR WILDLIFE RESERVES

AGRICULTURAL LANDS
PRIME AG LAND AG LAND

A. ADJACENT (mi)

B. > 4 (mi)

C. > 8 (mi)

D. ~ 1 (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

SEE APPENDIX 'A' FOR 4-MILE RADIUS MAP

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

FIT SITE INSPECTION - JULY 25-26, 1989

MDNR FILES

FIT FILES.



POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION

01 STATE 02 SITE NUMBER
MT 0020899647

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO COMPOUNDS	ANALYTES	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER	6	LANCASTER LABS	SKINNER & SHERMAN	AVAILABLE
SURFACE WATER		LANCASTER, PA.	WALTHAM, MA.	
WASTE				
AIR				
RUNOFF				
SPILL				
SOIL	10	LANCASTER LABS.	SKINNER & SHERMAN	AVAILABLE
VEGETATION		LANCASTER, PA.	WALTHAM, MA.	
OTHER				

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS
HNU 101	NO READINGS > BACKGROUND
DREAHER TUBES	" " > "
OXYGEN METER	" " > "
EXPLOSI-METER	" " > "
RADIATION AERE Mini	" " > "

IV. PHOTOGRAPHS AND MAPS

01 TYPE <input checked="" type="checkbox"/> GROUND <input type="checkbox"/> AERIAL	02 IN CUSTODY OF <u>ECOLGY & ENVIRONMENT, INC. CHICAGO, IL.</u> <small>(Name of Organization or Individual)</small>
03 MAPS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	04 LOCATION OF MAPS <u>ECOLGY & ENVIRONMENT, INC. CHICAGO, IL.</u>

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

PH
CONDUCTIVITY
TEMPERATURE

— MONITORING WELL SAMPLES

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

FT SITE INSPECTION, JULY 25-26, 1989
MDNR FILES
FIT FILES.



POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION

01 STATE 02 SITE NUMBER
ME D020899647

II. CURRENT OWNER(S)

01 NAME
KALAMAZOO COUNTY RD. COMM.
02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)
3801 E. KILGORE RD.
04 SIC CODE
05 CITY
KALAMAZOO
06 STATE
MI
07 ZIP CODE
49007

PARENT COMPANY (if applicable)

08 NAME
NONE
09 D+B NUMBER
10 STREET ADDRESS (P.O. Box, RFD #, etc.)
11 SIC CODE
12 CITY
13 STATE
14 ZIP CODE

01 NAME
02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)
04 SIC CODE
05 CITY
06 STATE
07 ZIP CODE

08 NAME
09 D+B NUMBER
10 STREET ADDRESS (P.O. Box, RFD #, etc.)
11 SIC CODE
12 CITY
13 STATE
14 ZIP CODE

01 NAME
02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)
04 SIC CODE
05 CITY
06 STATE
07 ZIP CODE

08 NAME
09 D+B NUMBER
10 STREET ADDRESS (P.O. Box, RFD #, etc.)
11 SIC CODE
12 CITY
13 STATE
14 ZIP CODE

01 NAME
02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)
04 SIC CODE
05 CITY
06 STATE
07 ZIP CODE

08 NAME
09 D+B NUMBER
10 STREET ADDRESS (P.O. Box, RFD #, etc.)
11 SIC CODE
12 CITY
13 STATE
14 ZIP CODE

III. PREVIOUS OWNER(S) (List most recent first)

01 NAME
UNKNOWN
02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)
04 SIC CODE
05 CITY
06 STATE
07 ZIP CODE

IV. REALTY OWNER(S) (if applicable; list most recent first)

01 NAME
NONE
02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)
04 SIC CODE
05 CITY
06 STATE
07 ZIP CODE

01 NAME
02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)
04 SIC CODE
05 CITY
06 STATE
07 ZIP CODE

01 NAME
02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)
04 SIC CODE
05 CITY
06 STATE
07 ZIP CODE

01 NAME
02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)
04 SIC CODE
05 CITY
06 STATE
07 ZIP CODE

01 NAME
02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)
04 SIC CODE
05 CITY
06 STATE
07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

FT SITE INSPECTION - JULY 25-26, 1989
MONR-FILES
FIT-FILES



POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION

01 STATE 02 SITE NUMBER

MI D020899647

II. CURRENT OPERATOR (Provide if different from owner)

OPERATOR'S PARENT COMPANY (if applicable)

01 NAME

02 D+B NUMBER

10 NAME

11 D+B NUMBER

KALAMAZOO CO. RD. COMM

NONE

03 STREET ADDRESS (P.O. Box, RFD #, etc.)

04 SIC CODE

12 STREET ADDRESS (P.O. Box, RFD #, etc.)

13 SIC CODE

3801 E. KILGORE RD.

05 CITY

06 STATE

07 ZIP CODE

14 CITY

15 STATE

16 ZIP CODE

KALAMAZOO

MI

49007

08 YEARS OF OPERATION

09 NAME OF OWNER

~1949-Present

KALAMAZOO COUNTY.

III. PREVIOUS OPERATOR(S) (List most recent first; provide only if different from owner)

PREVIOUS OPERATORS' PARENT COMPANIES (if applicable)

01 NAME

02 D+B NUMBER

10 NAME

11 D+B NUMBER

UNKNOWN

NONE

03 STREET ADDRESS (P.O. Box, RFD #, etc.)

04 SIC CODE

12 STREET ADDRESS (P.O. Box, RFD #, etc.)

13 SIC CODE

05 CITY

06 STATE

07 ZIP CODE

14 CITY

15 STATE

16 ZIP CODE

08 YEARS OF OPERATION

09 NAME OF OWNER DURING THIS PERIOD

01 NAME

02 D+B NUMBER

10 NAME

11 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)

04 SIC CODE

12 STREET ADDRESS (P.O. Box, RFD #, etc.)

13 SIC CODE

05 CITY

06 STATE

07 ZIP CODE

14 CITY

15 STATE

16 ZIP CODE

08 YEARS OF OPERATION

09 NAME OF OWNER DURING THIS PERIOD

01 NAME

02 D+B NUMBER

10 NAME

11 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)

04 SIC CODE

12 STREET ADDRESS (P.O. Box, RFD #, etc.)

13 SIC CODE

05 CITY

06 STATE

07 ZIP CODE

14 CITY

15 STATE

16 ZIP CODE

08 YEARS OF OPERATION

09 NAME OF OWNER DURING THIS PERIOD

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

FT SITE INSPECTION. JULY 25-26, 1989
MDNR FILES
FT FILES



POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION

01 STATE 02 SITE NUMBER
MI D020899647

II. ON-SITE GENERATOR

01 NAME NONE	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE 07 ZIP CODE

III. OFF-SITE GENERATOR(S)

01 NAME NONE	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE 07 ZIP CODE	05 CITY	06 STATE 07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE 07 ZIP CODE	05 CITY	06 STATE 07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME NONE	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE 07 ZIP CODE	05 CITY	06 STATE 07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE 07 ZIP CODE	05 CITY	06 STATE 07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

FIT SITE INSPECTION JULY 25-26, 1989
MANR FILES
PIT FILES.



POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION

01 STATE 02 SITE NUMBER
MI D020899647

II. PAST RESPONSE ACTIVITIES

01 <input type="checkbox"/> A. WATER SUPPLY CLOSED 04 DESCRIPTION N/A	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> B. TEMPORARY WATER SUPPLY PROVIDED 04 DESCRIPTION N/A	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> C. PERMANENT WATER SUPPLY PROVIDED 04 DESCRIPTION N/A	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> D. SPILLED MATERIAL REMOVED 04 DESCRIPTION N/A	02 DATE _____	03 AGENCY _____
01 <input checked="" type="checkbox"/> E. CONTAMINATED SOIL REMOVED 04 DESCRIPTION AN UNDETERMINED QUANTITY OF SOIL WAS REMOVED AT KCRC'S INITIATIVE BY FULTON EXCAVATING AND DEPOSITED IN WEST SIDE OF THREE RIVERS, MI.	02 DATE FALL 1985 SUMMER 1987	03 AGENCY _____
01 <input type="checkbox"/> F. WASTE REPACKAGED 04 DESCRIPTION N/A	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> G. WASTE DISPOSED ELSEWHERE 04 DESCRIPTION N/A	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> H. ON SITE BURIAL 04 DESCRIPTION N/A	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> I. IN SITU CHEMICAL TREATMENT 04 DESCRIPTION N/A	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> J. IN SITU BIOLOGICAL TREATMENT 04 DESCRIPTION N/A	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> K. IN SITU PHYSICAL TREATMENT 04 DESCRIPTION N/A	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> L. ENCAPSULATION 04 DESCRIPTION N/A	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> M. EMERGENCY WASTE TREATMENT 04 DESCRIPTION N/A	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> N. CUTOFF WALLS 04 DESCRIPTION N/A	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> O. EMERGENCY DIKING/SURFACE WATER DIVERSION 04 DESCRIPTION N/A	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> P. CUTOFF TRENCHES/SUMP 04 DESCRIPTION N/A	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> Q. SUBSURFACE CUTOFF WALL 04 DESCRIPTION N/A	02 DATE _____	03 AGENCY _____



POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION

01 STATE 02 SITE NUMBER
MI D020899647

II. PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED
04 DESCRIPTION

02 DATE _____

03 AGENCY _____

N/A

01 ☐ S. CAPPING/COVERING
04 DESCRIPTION

02 DATE _____

03 AGENCY _____

N/A

01 ☐ T. BULK TANKAGE REPAIRED
04 DESCRIPTION

02 DATE _____

03 AGENCY _____

N/A

01 ☐ U. GROUT CURTAIN CONSTRUCTED
04 DESCRIPTION

02 DATE _____

03 AGENCY _____

N/A

01 ☐ V. BOTTOM SEALED
04 DESCRIPTION

02 DATE _____

03 AGENCY _____

N/A

01 ☐ W. GAS CONTROL
04 DESCRIPTION

02 DATE _____

03 AGENCY _____

N/A

01 ☐ X. FIRE CONTROL
04 DESCRIPTION

02 DATE _____

03 AGENCY _____

N/A

01 ☐ Y. LEACHATE TREATMENT
04 DESCRIPTION

02 DATE _____

03 AGENCY _____

N/A

01 ☐ Z. AREA EVACUATED
04 DESCRIPTION

02 DATE _____

03 AGENCY _____

N/A

01 ☐ 1. ACCESS TO SITE RESTRICTED
04 DESCRIPTION

02 DATE _____

03 AGENCY _____

N/A

01 ☐ 2. POPULATION RELOCATED
04 DESCRIPTION

02 DATE _____

03 AGENCY _____

N/A

01 ☐ 3. OTHER REMEDIAL ACTIVITIES
04 DESCRIPTION

02 DATE _____

03 AGENCY _____

N/A

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

FIT SITE INSPECTION - JULY 25-26, 1989

MDNR - FILES

FIT - FILES



POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION

01 STATE 02 SITE NUMBER
MI D020899647

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☒ YES ☐ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

MDNR REQUESTED A HYDROGEOLOGIC AS KCRCL
IN MARCH OF 1985.

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

FIT SITE INSPECTION JULY 25-26, 1989
MDNR-FILES
FIT-FILES

APPENDIX C

FIT SITE PHOTOGRAPHS

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: KALAMAZOO COUNTY ROAD COMMISSION

PAGE 1 OF 14

U.S. EPA ID: MID020899647

TDD: F05-8802-022

PAN: fm078154



DATE: > 7/25/89 TIME: > 1445 DIRECTION OF PHOTOGRAPH: > N PHOTOGRAPHED BY: > RESLAUGHTER

WEATHER CONDITIONS: > Cloudy, Humid, 90's SAMPLE ID (if applicable): > N/A

DESCRIPTION: > PANORAMIC VIEW OF ROAD COMMISSION FACILITY ENTRANCE AND BUILDINGS. NOTE ELECTRONIC SECURITY GATE AT CENTER.

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: KALAMAZOO COUNTY ROAD COMMISSION

PAGE 2 OF 14

U.S. EPA ID: MID020899647

TDD: F05-8802-022

PAN: FMD078154



DATE: > 7/25/89 TIME: > 1453 DIRECTION OF PHOTOGRAPH: > W PHOTOGRAPHED BY: > RESLAUGHTER

WEATHER CONDITIONS: > Cloudy, Humid, 90's SAMPLE ID (if applicable): > N/A

DESCRIPTION: > INTERIOR PANORAMIC DEPICTS STORAGE FACILITIES. NOTE DRUMS OF ROAD LINE PAINT AND CALCIUM CHLORIDE TANK RIGHT OF CENTER.

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: KALAMAZOO COUNTY ROAD COMMISSION

PAGE 3 OF 14

U.S. EPA ID: MID020899647

TDD: F05-8802-022

PAN: FMD078154



DATE: > 7/25/89 TIME: > 1505 DIRECTION OF PHOTOGRAPH: > SW PHOTOGRAPHED BY: > RESLAUGHTER

WEATHER CONDITIONS: > Cloudy, Humid, 90's SAMPLE ID (if applicable): > N/A

DESCRIPTION: > NORTHWEST STORAGE LOT PANORAMIC. PILES AT REAR (LEFT OF CENTER) ARE PAVING MAT'L. PILES IN FOREGROUND (RIGHT OF CENTER) ARE ROAD SAND AND FAR RIGHT ARE DRY WELL BORING MATERIAL.

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: KALAMAZOO COUNTY ROAD COMMISSION

PAGE 4 OF 14

U.S. EPA ID: MID020899647

TDD: F05-8802-022

PAN: FM078154



DATE: > 7/25/89 TIME: > 1503 DIRECTION OF PHOTOGRAPH: > WNW PHOTOGRAPHED BY: > RESLAUGHTER
NNW

WEATHER CONDITIONS: > Cloudy, Humid, 90's SAMPLE ID (if applicable): > N/A

DESCRIPTION: > PART 2 OF 4 FRAME PANORAMIC VIEWING THE SWAMPY (WETLAND) AREA
NORTH OF SITE. DAVIS CREEK RUNS THROUGH FRAME WHERE UNDERBRUSH CHANGES
FROM HERBACEOUS TO REEDS.

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: KALAMAZOO COUNTY ROAD COMMISSION

PAGE 5 OF 14

U.S. EPA ID: MID020899647

TDD: F05-8802-022

PAN: FM078154



DATE: > 7/25/89 TIME: > 1503 DIRECTION OF PHOTOGRAPH: > N →
NNE

PHOTOGRAPHED BY: > RESLAUGHTER

WEATHER CONDITIONS: > CLOUDY, HUMID, 90'S

SAMPLE ID (if applicable): > N/A

DESCRIPTION: > PART 2 OF PRECEDING PAGE.

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: KALAMAZOO COUNTY ROAD COMMISSION

PAGE 6 OF 14

U.S. EPA ID: MI1020899647 TDD: FOS-8802-022

PAN: FM10781SA

DATE: > 7/25/89

TIME: > 1507

DIRECTION OF
PHOTOGRAPH:

> NW

WEATHER

CONDITIONS:

> CLOUDY,

> HUMID; 90'S

PHOTOGRAPHED BY:

> RESLAUGHTER

SAMPLE ID

(if applicable):

> N/A



DESCRIPTION: > PHOTO DEPICTS THE POINT OF CONFLUENCE
> BETWEEN THE DRAINAGE CULVERT AND DAVIS CREEK.

DATE: > 7/25/89

TIME: > 1455

DIRECTION OF
PHOTOGRAPH:

> SOUTH.

WEATHER

CONDITIONS:

> CLOUDY,

> HUMID; 90'S

PHOTOGRAPHED BY:

> RESLAUGHTER

SAMPLE ID

(if applicable):

> N/A



DESCRIPTION: > INTERIOR PHOTO OF GARAGE AREA TOWARD THE
> SOUTH OF THE SITE PROPERTY.

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: KALAMAZOO COUNTY ROAD COMMISSIONPAGE 7 OF 14U.S. EPA ID: MI12020899647 TDD: F05-8802-022PAN: FM10781SADATE: > 7/25/89TIME: > 1105DIRECTION OF
PHOTOGRAPH:> W

WEATHER

CONDITIONS:

> CLOUDY,> HUMID; 90'S

PHOTOGRAPHED BY:

> RESLAUGHTER

SAMPLE ID

(if applicable):

> S1DESCRIPTION: > SOIL SAMPLE S1>DATE: > 7/25/89TIME: > 1110DIRECTION OF
PHOTOGRAPH:> W

WEATHER

CONDITIONS:

> CLOUDY,> HUMID; 90'S

PHOTOGRAPHED BY:

> RESLAUGHTER

SAMPLE ID

(if applicable):

> SRDESCRIPTION: > SOIL SAMPLE SR.>

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: KALAMAZOO COUNTY ROAD COMMISSIONPAGE 8 OF 14U.S. EPA ID: MI1020899647 TDD: F05-8802-022PAN: FM10781SADATE: > 7/25/89TIME: > 1120DIRECTION OF
PHOTOGRAPH:> SOUTH

WEATHER

CONDITIONS:

> CLOUDY,> HUMID; 90's

PHOTOGRAPHED BY:

> RESLAUGHTER

SAMPLE ID

(if applicable):

> S3DESCRIPTION: > SOIL SAMPLE S3.

>

DATE: > 7/25/89TIME: > 1125DIRECTION OF
PHOTOGRAPH:> WEST

WEATHER

CONDITIONS:

> CLOUDY,> HUMID; 90's

PHOTOGRAPHED BY:

> RESLAUGHTER

SAMPLE ID

(if applicable):

> S4DESCRIPTION: > SOIL SAMPLE S4.

>

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: KALAMAZOO COUNTY ROAD COMMISSION

PAGE 9 OF 14

U.S. EPA ID: MI020899647 TDD: F05-8802-022

PAN: FM10781SA

DATE: > 7/25/89

TIME: > 1205

DIRECTION OF PHOTOGRAPH:

> SOUTH

WEATHER

CONDITIONS:

> CLOUDY,

> HUMID; 90'S

PHOTOGRAPHED BY:

> RESLAUGHTER

SAMPLE ID

(if applicable):

> SS



DESCRIPTION: > SOIL SAMPLE SS; A SEDIMENT SAMPLE FROM

> DAVIS CREEK

DATE: > 7/25/89

TIME: > 1220

DIRECTION OF PHOTOGRAPH:

> WEST

WEATHER

CONDITIONS:

> CLOUDY,

> HUMID; 90'S

PHOTOGRAPHED BY:

> RESLAUGHTER

SAMPLE ID

(if applicable):

> S6



DESCRIPTION: > SOIL SAMPLE S6; A SEDIMENT SAMPLE FROM

> DAVIS CREEK

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: KALAMAZOO COUNTY ROAD COMMISSIONPAGE 10 OF 14U.S. EPA ID: MI D020899647 TDD: F05-8802-022PAN: FM10781SADATE: > 7/25/89TIME: > 1245DIRECTION OF
PHOTOGRAPH:> NWWEATHER
CONDITIONS:> CLOUDY,> HUMID; 90's

PHOTOGRAPHED BY:

> RESLAUGHTERSAMPLE ID
(if applicable):> S7DESCRIPTION: > SEDIMENT SAMPLE S7.

>

DATE: > 7/25/89TIME: > 1255DIRECTION OF
PHOTOGRAPH:> NORTH.WEATHER
CONDITIONS:> CLOUDY,> HUMID; 90's

PHOTOGRAPHED BY:

> RESLAUGHTERSAMPLE ID
(if applicable):> S8DESCRIPTION: > SOIL SAMPLE S8.

>

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: KALAMAZOO COUNTY ROAD COMMISSION

PAGE 11 OF 14

U.S. EPA ID: MI2020899647 TDD: F05-8802-022

PAN: FM10781SA

DATE: > 7/25/89

TIME: > 1325

DIRECTION OF PHOTOGRAPH:

> West

WEATHER

CONDITIONS:

> Cloudy,

> Humid; 90's

PHOTOGRAPHED BY:

> RESLAUGHTER

SAMPLE ID

(if applicable):

> S9



DESCRIPTION: > Sediment Sample S9.

>

DATE: > 7/25/89

TIME: > 1410

DIRECTION OF PHOTOGRAPH:

> West

WEATHER

CONDITIONS:

> Cloudy,

> Humid; 90's

PHOTOGRAPHED BY:

> RESLAUGHTER

SAMPLE ID

(if applicable):

> S10



DESCRIPTION: > Soil Sample S10.

>

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: KALAMAZOO COUNTY ROAD COMMISSION

PAGE 12 OF 14

U.S. EPA ID: MI1020899647 TDD: F058802-022

PAN: FM10781SA

DATE: > 7/26/89

TIME: > 1013

DIRECTION OF
PHOTOGRAPH:
> SE

WEATHER
CONDITIONS:
> CLOUDY,
> HUMID; 90'S

PHOTOGRAPHED BY:
> RESLAUGHTER

SAMPLE ID
(if applicable):
> MW1



DESCRIPTION: > MONITORING WELL SAMPLE MW1

>

DATE: > 7/26/89

TIME: > 1015

DIRECTION OF
PHOTOGRAPH:
> NORTH

WEATHER
CONDITIONS:
> CLOUDY,
> HUMID; 90'S

PHOTOGRAPHED BY:
> RESLAUGHTER

SAMPLE ID
(if applicable):
> MW2



DESCRIPTION: > MONITORING WELL SAMPLE MW2

>

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: KALAMAZOO COUNTY ROAD COMMISSION

PAGE 13 OF 14

U.S. EPA ID: MI1020899647 TDD: F05-8802-022

PAN: FM10781SA

DATE: > 7/26/89

TIME: > 1100

DIRECTION OF PHOTOGRAPH:

> NW

WEATHER

CONDITIONS:

> CLOUDY,

> HUMID; 90's

PHOTOGRAPHED BY:

> RESLAUGHTER

SAMPLE ID

(if applicable):

> MW3



DESCRIPTION: > MONITORING WELL SAMPLE MW3.

>

DATE: > 7/26/89

TIME: > 1115

DIRECTION OF PHOTOGRAPH:

> WEST

WEATHER

CONDITIONS:

> CLOUDY,

> HUMID; 90's

PHOTOGRAPHED BY:

> RESLAUGHTER

SAMPLE ID

(if applicable):

> MW4



DESCRIPTION: > MONITORING WELL SAMPLE MW4.

>

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: KALAMAZOO COUNTY ROAD COMMISSION

PAGE 14 OF 14

U.S. EPA ID: MID020899647 TDD: FOS-8802-022

PAN: FMIO781SA

DATE: > 7/26/89

TIME: > 1345

DIRECTION OF PHOTOGRAPH:

> WEST

WEATHER

CONDITIONS:

> CLOUDY,

> HUMID, 90's

PHOTOGRAPHED BY:

> RESLAUGHTER

SAMPLE ID

(if applicable):

> MW5



DESCRIPTION: > MONITORING WELL SAMPLE MW5

>

DATE: > 7/26/89

TIME: > 1345

DIRECTION OF PHOTOGRAPH:

> WEST

WEATHER

CONDITIONS:

> CLOUDY,

> HUMID 90's

PHOTOGRAPHED BY:

> RESLAUGHTER

SAMPLE ID

(if applicable):

> MW6



DESCRIPTION: > MONITORING WELL SAMPLE MW6.

>

APPENDIX D

**U.S. EPA TARGET COMPOUND LIST AND
TARGET ANALYTE LIST
QUANTITATION/DETECTION LIMITS**

Table A
Contract Laboratory Program
Target Compound List
Semivolatiles Quantitation Limits

COMPOUND	CAS #	WATER	SOIL SEDIMENT SLUDGE
Phenol	108-95-2	10 ug/L	330 ug/Kg
bis(2-Chloroethyl) ether	111-44-4	10	330
2-Chlorophenol	95-57-8	10	330
1,3-Dichlorobenzene	541-73-1	10	330
1,4-Dichlorobenzene	106-46-7	10	330
Benzyl Alcohol	100-51-6	10	330
1,2-Dichlorobenzene	95-50-1	10	330
2-Methylphenol	95-48-7	10	330
bis(2-Chloroisopropyl) ether	108-60-1	10	330
4-Methylphenol	106-44-5	10	330
N-Nitroso-di-n-dipropylamine	621-64-7	10	330
Hexachloroethane	67-72-1	10	330
Nitrobenzene	98-95-3	10	330
Isophorone	78-59-1	10	330
2-Nitrophenol	88-75-5	10	330
2,4-Dimethylphenol	105-67-9	10	330
Benzoic Acid	65-85-0	50	1600
bis(2-Chloroethoxy) methane	111-91-1	10	330
2,4-Dichlorophenol	120-83-2	10	330
1,2,4-Trichlorobenzene	120-82-1	10	330
Naphthalene	91-20-3	10	330
4-Chloroaniline	106-47-8	10	330
Hexachlorobutadiene	87-68-3	10	300
4-Chloro-3-methylphenol	59-50-7	10	330
2-Methylnaphthalene	91-57-6	10	330
Hexachlorocyclopentadiene	77-47-4	10	330
2,4,6-Trichlorophenol	88-06-2	10	330
2,4,5-Trichlorophenol	95-95-4	50	1600
2-Chloronaphthalene	91-58-7	10	330
2-Nitroaniline	88-74-4	50	1600
Dimethylphthalate	131-11-3	10	330
Acenaphthylene	208-96-8	10	330
2,6-Dinitrotoluene	606-20-2	10	330
3-Nitroaniline	99-09-2	50	1600
Acenaphthene	83-32-9	10	330
2,4-Dinitrophenol	51-28-5	50	1600
4-Nitrophenol	100-02-7	50	1600
Dibenzofuran	132-64-9	10	330
2,4-Dinitrotoluene	121-14-2	10	330
Diethylphthalate	84-66-2	10	330
4-Chlorophenyl-phenyl ether	7005-72-3	10	330

Table A
Contract Laboratory Program
Target Compound List
Semivolatiles Quantitation Limits

COMPOUND	CAS #	WATER	SOIL SLUDGE SEDIMENT
Fluorene	86-73-7	10 ug/L	330 ug/Kg
4-Nitroaniline	100-01-6	50	1600
4,6-Dinitro-2-methylphenol	534-52-1	50	1600
N-nitrosodiphenylamine	86-30-6	10	330
4-Bromophenyl-phenylether	101-55-3	10	330
Hexachlorobenzene	118-74-1	10	330
Pentachlorophenol	87-86-5	50	1600
Phenanthrene	85-01-8	10	330
Anthracene	120-12-7	10	330
Di-n-butylphthalate	84-74-2	10	330
Fluoranthene	206-44-0	10	330
Pyrene	129-00-0	10	330
Butylbenzylphthalate	85-68-7	10	330
3,3'-Dichlorobenzidine	91-94-1	20	660
Benzo(a)anthracene	56-55-3	10	330
Chrysene	218-01-9	10	330
bis(2-Ethylhexyl)phthalate	117-81-7	10	330
Di-n-octylphthalate	117-84-0	10	330
Benzo(b)fluoranthene	205-99-2	10	330
Benzo(k)fluoranthene	207-08-9	10	330
Benzo(a)pyrene	50-32-8	10	330
Indeno(1,2,3-cd)pyrene	193-39-5	10	330
Dibenz(a,h)anthracene	53-70-3	10	330
Benzo(g,h,i)perylene	191-24-2	10	330

Table A
Contract Laboratory Program
Target Compound List
Pesticide and PCB Quantitation Limits

COMPOUND	CAS #	WATER	SOIL SEDIMENT SLUDGE
alpha-BHC	319-84-6	0.05 ug/L	8 ug/Kg
beta-BHC	319-85-7	0.05	8
delta-BHC	319-86-8	0.05	8
gamma-BHC (Lindane)	58-89-9	0.05	8
Heptachlor	76-44-8	0.05	8
Aldrin	309-00-2	0.05	8
Heptachlor epoxide	1024-57-3	0.05	8
Endosulfan I	959-98-8	0.05	8
Dieldrin	60-57-1	0.10	16
4,4'-DDE	72-55-9	0.10	16
Endrin	72-20-8	0.10	16
Endosulfan II	33213-65-9	0.10	16
4,4'-DDD	72-54-8	0.10	16
Endosulfan sulfate	1031-07-8	0.10	16
4,4'-DDT	50-29-3	0.10	16
Methoxychlor (Mariate)	72-43-5	0.5	80
Endrin ketone	53494-70-5	0.10	16
alpha-Chlordane	5103-71-9	0.5	80
gamma-chlordane	5103-74-2	0.5	80
Toxaphene	8001-35-2	1.0	160
AROCLOR-1016	12674-11-2	0.5	80
AROCLOR-1221	11104-28-2	0.5	80
AROCLOR-1232	11141-16-5	0.5	80
AROCLOR-1242	53469-21-9	0.5	80
AROCLOR-1248	12672-29-6	0.5	80
AROCLOR-1254	11097-69-1	1.0	160
AROCLOR-1260	11096-82-5	1.0	160

Table A
Contract Laboratory Program
Target Analyte List
Inorganic Quantitation Limits

COMPOUND	PROCEDURE	SOIL WATER	SEDIMENT SLUDGE
Aluminum	ICP	200 ug/L	40 mg/Kg
Antimony	Furnace	60	2.4
Arsenic	Furnace	10	2
Barium	ICP	200	40
Beryllium	ICP	5	1
Cadmium	ICP	5	1
Calcium	ICP	5000	1000
Chromium	ICP	10	2
Cobalt	ICP	50	10
Copper	ICP	25	5
Iron	Icp	100	20
Lead	Furnace	5	1
Magnesium	ICP	5000	1000
Manganese	ICP	15	3
Mercury	Cold Vapor	0.2	0.008
Nickel	ICP	40	8
Potassium	ICP	5000	1000
Selenium	Furnace	5	1
Silver	ICP	10	2
Sodium	ICP	5000	1000
Thallium	Furnace	10	2
Vanadium	ICP	50	10
Zinc	ICP	20	4
Cyanide	Color	10	2

APPENDIX E

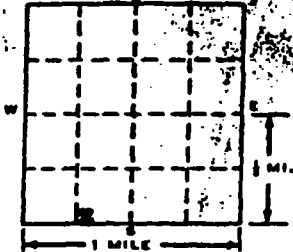
WELL LOGS OF THE AREA OF THE SITE

6 PAGES REDACTED
DUE TO PII AND
GEOGRAPHICAL LOCATION

WATER WELL RECORD

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

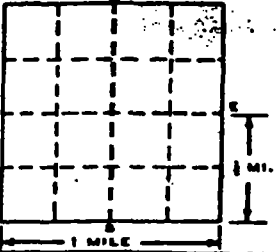
7

1 LOCATION OF WELL			3 OWNER OF WELL:		
County Kazoo	Township Name Pavilion	Fraction $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$	Section Number 6	Town Number N/S.	Range Number E/W.
Distance And Direction from Road Intersections 1/10th M S of E Kilgore Rd. at end of 26th St.			Address Frab Conveyers Inc. 5944 E. Kilgore Rd. Kalamazoo, Michigan		
Street address & City of Well Location 26th St.			4 WELL DEPTH: (completed) Date of Completion 161 ft. 10/29 75		
Locate with "X" in section below 			5 <input type="checkbox"/> Cable tool <input type="checkbox"/> Rotary <input type="checkbox"/> Driven <input type="checkbox"/> Dug <input type="checkbox"/> Hollow rod <input checked="" type="checkbox"/> Jettied <input type="checkbox"/> Bored <input type="checkbox"/>		
Sketch Map:			6 USE: <input type="checkbox"/> Domestic <input type="checkbox"/> Public Supply <input checked="" type="checkbox"/> Industry <input type="checkbox"/> Irrigation <input type="checkbox"/> Air Conditioning <input type="checkbox"/> Commercial <input type="checkbox"/> Test Well <input type="checkbox"/>		
2 FORMATION			7 CASING: Threaded <input checked="" type="checkbox"/> Welded <input type="checkbox"/> Height: Above/Below Diam. _____ Surface 1 ft.		
THICKNESS OF STRATUM			_____ in. to _____ ft. Depth Weight 1200 lbs./ft. _____ in. to _____ ft. Depth Drive Shoe? Yes <input type="checkbox"/> No <input type="checkbox"/>		
DEPTH TO BOTTOM OF STRATUM			8 SCREEN:		
sand, gravel 40 401			Type: wire wound Dia.: 4		
sand, gravel, clay 111 151			Slot/Gauge 7 Length 10		
sand, fine 10 161			Set between _____ ft. and _____ ft.		
			Fittings: lead packer		
			18" blank, plug bottom		
			9 STATIC WATER LEVEL 15 ft. below land surface		
			10 PUMPING LEVEL below land surface _____ ft. after _____ hrs. pumping _____ g.p.m. _____ ft. after _____ hrs. pumping _____ g.p.m.		
			11 WATER QUALITY in Parts Per Million: Iron (Fe) _____ Chlorides (Cl) _____ Hardness _____ Other _____		
			12 WELL HEAD COMPLETION: <input type="checkbox"/> In Approved Pit <input checked="" type="checkbox"/> Pitless Adapter <input type="checkbox"/> 12" Above Grade		
			13 Well Grouted? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Neat Cement <input type="checkbox"/> Bentonite <input type="checkbox"/> Depth: From _____ ft. to _____ ft.		
			14 Nearest Source of possible contamination 150 feet E Direction septic Type Well disinfected upon completion <input type="checkbox"/> Yes <input type="checkbox"/> No		
			15 PUMP: <input type="checkbox"/> Not installed Manufacturer's Name Rede Pump Co. Model Number 6D35P101 HP 1 1/2 Volts 220 Length of Drop Pipe 105 ft. capacity 37 G.P.M. Type: <input checked="" type="checkbox"/> Submersible <input type="checkbox"/> Jet <input type="checkbox"/> Reciprocating		
GROUND SURFACE ELEV. 855					
STATIC WATER ELEV. 840					
16 Remarks, elevation, source of data, etc.			17 WATER WELL CONSTRUCTOR'S CERTIFICATION This well was drilled under my supervision and I am a duly licensed and bonded contractor in the State of Michigan. REGISTERED BUSINESS NAME _____ Address _____ Signed _____ Date _____ AUTHORIZED REPRESENTATIVE		

WATER WELL RECORD

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

8

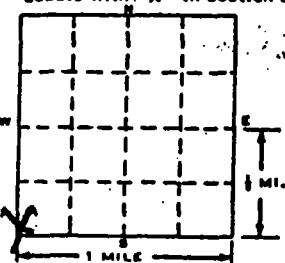
1 LOCATION OF WELL		Township Name		Fraction		Section Number		Town Number		Page Number	
County <u>Kal.</u>		<u>Comstock</u>		<u>1/4</u> <u>1/4</u> <u>1/4</u>		<u>31</u>		<u>N/S.</u>		<u>107</u> E/W.	
Distance And Direction from Road Intersections <u>333 ft. N. of E. Kilgore Rd.</u> <u>7/10ths N. E. of Sprinkle Rd.</u>						3 OWNER OF WELL: <u>Dopp Pump Co.</u> <u>Comstock, Michigan</u> Address <u>TO THE MICHIGAN DEPARTMENT OF PUBLIC HEALTH</u>					
Street address & City of Well Location Locate with "X" in section below <div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> Sketch Map: </div> </div>						4 WELL DEPTH: (completed) <u>63</u> ft. 5 <input type="checkbox"/> Cable tool <input type="checkbox"/> Rotary <input type="checkbox"/> Driven <input type="checkbox"/> Dug <input type="checkbox"/> Hollow rod <input checked="" type="checkbox"/> Jetted <input type="checkbox"/> Bored <input type="checkbox"/>					
2 FORMATION <u>sand, gravel</u> THICKNESS OF STRATUM <u>63</u> DEPTH TO BOTTOM OF STRATUM <u>63</u>						6 USE: <input checked="" type="checkbox"/> Domestic <input type="checkbox"/> Public Supply <input type="checkbox"/> Industry <input type="checkbox"/> Irrigation <input type="checkbox"/> Air Conditioning <input type="checkbox"/> Commercial <input type="checkbox"/> Test Well <input type="checkbox"/>					
						7 CASING: Threaded <input checked="" type="checkbox"/> Welded <input type="checkbox"/> Height: Above/Below Surface <u>1</u> ft. Weight <u>1200</u> lbs./ft. Drive Shoe? Yes <input type="checkbox"/> No <input type="checkbox"/>					
8 SCREEN: Type <u>wire wound</u> Dia.: <u>1/4</u> Slot/Gauze <u>12</u> Length <u>1</u> Set between _____ ft. and _____ ft. Fittings: <u>lead packer</u> <u>1 1/2 thread in bottom</u>						9 STATIC WATER LEVEL <u>15</u> ft. below land surface					
						10 PUMPING LEVEL below land surface _____ ft. after _____ hrs. pumping _____ G.P.M. _____ ft. after _____ hrs. pumping _____ G.P.M.					
11 WATER QUALITY in Parts Per Million: Iron (Fe) _____ Chloride (Cl) _____ Hardness _____ Other _____						12 WELL HEAD COMPLETION: <input type="checkbox"/> In Approved Pit <input type="checkbox"/> Pitless Adapter <input checked="" type="checkbox"/> 12" Above Grade					
						13 Well Grouted? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Neat Cement <input type="checkbox"/> Bentonite <input type="checkbox"/> Depth: From _____ ft. to _____ ft.					
14 Nearest Source of possible contamination _____ feet _____ Direction _____ Type _____ Well disinfected upon completion: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No						15 PUMP: <input checked="" type="checkbox"/> Not installed Manufacturer's Name _____ Model Number _____ HP _____ Volts _____ Length of Drop Pipe _____ ft. capacity _____ G.P.M. Type: <input type="checkbox"/> Submersible <input type="checkbox"/> Jet <input type="checkbox"/> Reciprocating					
						16 Remarks, elevation, source of data, etc. <u>GROUND SURFACE ELEV. <u>861</u></u> <u>STATIC WATER ELEV. <u>846</u></u>					
17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. <u>[Signature]</u> REGISTERED BUSINESS NAME _____ REGISTRATION NO. _____ Address <u>2928 Townsend</u> Signed _____ AUTHORIZED REPRESENTATIVE Date <u>3/16/73</u>											

WATER WELL RECORD

REV. 1-64 PA 100M

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

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1 LOCATION OF WELL			3 OWNER OF WELL																				
County <u>Calhoun</u>	Township Name <u>Comstock</u>	Fraction <u>S.W. 1/4</u>	Section Number <u>31</u>	Town Number <u>2</u>	Range Number <u>10 N. W.</u>																		
Distance And Direction from Road Intersections <u>5200 N. W. 22nd St. (Comstock Rd.)</u>			Address <u>6000 Iron Rd. N. W. 22nd St. Comstock Mich.</u>																				
Street address & City of Well Location <u>5200 N. W. 22nd St. W. Kilgore</u>			WELL DEPTH: (completed) Date of Completion <u>63</u> " <u>1/24/79</u>																				
Locate with "X" in section below 			<input type="checkbox"/> Cable tool <input type="checkbox"/> Rotary <input type="checkbox"/> Driven <input type="checkbox"/> Dug <input type="checkbox"/> Hollow rod <input type="checkbox"/> Jotted <input type="checkbox"/> Bored <input type="checkbox"/>																				
2 FORMATION <table border="1"> <thead> <tr> <th>FORMATION</th> <th>THICKNESS OF STRATUM</th> <th>DEPTH TO BOTTOM OF STRATUM</th> </tr> </thead> <tbody> <tr><td>Sand, Gravel</td><td>18</td><td>18</td></tr> <tr><td>Water Sand</td><td>7</td><td>25</td></tr> <tr><td>Sand, Gravel</td><td>9</td><td>34</td></tr> <tr><td>Clay</td><td>18</td><td>54</td></tr> <tr><td>Water Sand</td><td>11</td><td>63</td></tr> </tbody> </table>			FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	Sand, Gravel	18	18	Water Sand	7	25	Sand, Gravel	9	34	Clay	18	54	Water Sand	11	63	6 USE: <input checked="" type="checkbox"/> Domestic <input type="checkbox"/> Public Supply <input type="checkbox"/> Industry <input type="checkbox"/> Irrigation <input type="checkbox"/> Air Conditioning <input type="checkbox"/> Commercial <input type="checkbox"/> Test Well <input type="checkbox"/>		
FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM																					
Sand, Gravel	18	18																					
Water Sand	7	25																					
Sand, Gravel	9	34																					
Clay	18	54																					
Water Sand	11	63																					
GROUND SURFACE ELEV. <u>855</u>			7 CASING: Threaded <input checked="" type="checkbox"/> Welded <input type="checkbox"/> Height: Above/Below Surface <u>1</u> ft.																				
STATIC WATER ELEV. <u>843</u>			4 in. to <u>5</u> ft. Depth in. to <u> </u> ft. Depth Weight <u> </u> lbs./ft. Drive Shoe? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>																				
			8 SCREEN: Type <u>Look Stainless</u> Dia. <u>4</u> Slot/Gauge <u>10</u> Length <u>8</u> Set between <u>15</u> ft. and <u>63</u> ft.																				
			Fittings: <u>1-1/2" x 1/2" N. P. 1/2"</u>																				
			9 STATIC WATER LEVEL <u>12</u> ft. below land surface																				
			10 PUMPING LEVEL below land surface <u>53</u> ft. after <u>1</u> hrs. pumping <u>60</u> g.p.m. <u> </u> ft. after <u> </u> hrs. pumping <u> </u> g.p.m.																				
			11 WATER QUALITY in Parts Per Million: Iron (Fe) <u> </u> Chlorides (Cl) <u> </u> Hardness <u> </u> Other <u> </u>																				
			12 WELL HEAD COMPLETION: <input type="checkbox"/> In Approved Pit <input checked="" type="checkbox"/> Pitless Adapter <input checked="" type="checkbox"/> 12" Above Grade																				
			13 Well Grouted? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Neat Cement <input type="checkbox"/> Bentonite <input type="checkbox"/> Depth: From <u> </u> ft. to <u> </u> ft.																				
			14 Nearest Source of possible contamination <u>25</u> feet <u>S</u> Direction <u>SE DW</u> Type <u> </u> Well disinfected upon completion <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No																				
			15 PUMP: <input type="checkbox"/> Not installed Manufacturer's Name <u>Herzog</u> Model Number <u>201250</u> HP <u>1/2</u> Volts <u>220</u> Length of Drop Pipe <u>10</u> ft. capacity <u>15</u> G.P.M. Type: <input checked="" type="checkbox"/> Submersible <input type="checkbox"/> Jet <input type="checkbox"/> Reciprocating																				
16 Remarks, elevation, source of data, etc. <u>WATER WELL POINT</u> <u>NO 1912 DATED 4/23/79</u>			17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. <u>Walter</u> REGISTERED BUSINESS NAME <u>Walter</u> REGISTRATION NO. <u>0210</u> Address <u>1851 N. 22nd St. Battle Creek</u> Signed <u>Walter</u> Date <u>8/23/79</u> AUTHORIZED REPRESENTATIVE																				

USE A 2ND SHEET IF NEEDED

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

10

1 LOCATION OF WELL			3 OWNER OF WELL:										
County Kalamazoo	Township Name PRATON	Fraction 1/2 Sec 10 T. 36 N. R. 10 W.	Section Number 6	Town Number 3 N.S.	Range Number 10 E.W.								
Distance And Direction from Road Intersections 1/2 mi. east of Sprinkle Rd. on Hilgore with side of street			Address 5282 Hilgore Rd Elkhart										
Street address & City of Well Location 5070 C. "N" Ave			4 WELL DEPTH: (completed) Date of Completion 58 ft. 6/27/72										
<div style="display: flex; align-items: center;"> <div style="flex: 1;"> </div> <div style="flex: 1;"> <p>Sketch Map</p> </div> </div>			5 <input checked="" type="checkbox"/> Cable tool <input type="checkbox"/> Rotary <input type="checkbox"/> Driven <input type="checkbox"/> Dug <input type="checkbox"/> Hollow rod <input type="checkbox"/> Jetted <input type="checkbox"/> Bored <input type="checkbox"/>										
			6 USE: <input type="checkbox"/> Domestic <input type="checkbox"/> Public Supply <input type="checkbox"/> Industry <input type="checkbox"/> Irrigation <input type="checkbox"/> Air Conditioning <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Test Well <input type="checkbox"/>										
2 FORMATION			7 CASING: Threaded <input checked="" type="checkbox"/> Welded <input type="checkbox"/> Height: Above/Below Diem. _____ Surface _____ ft.										
			<div style="display: flex; justify-content: space-between;"> <div> 4 in. to 53 ft. Depth _____ in. to _____ ft. Depth </div> <div> Weight _____ lbs./ft. Drive Shoe? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> </div> </div>										
<div style="display: flex;"> <div style="flex: 1;"> Should clay water sand (concrete) </div> <div style="flex: 1;"> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>THICKNESS OF STRATUM</th> <th>DEPTH TO BOTTOM OF STRATUM</th> </tr> </thead> <tbody> <tr><td>45</td><td>45</td></tr> <tr><td>7</td><td>52</td></tr> <tr><td>6</td><td>58</td></tr> </tbody> </table> </div> </div>			THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	45	45	7	52	6	58	8 SCREEN: Type: JANSON Dia.: 5" Slot/Gauge 10 Length 5 ft. Set between 53 ft. and 58 ft. Fittings: 12" BLANK FIG-K-PAC		
			THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM									
45	45												
7	52												
6	58												
9 STATIC WATER LEVEL 30 ft. below land surface			10 PUMPING LEVEL below land surface 50 ft. after _____ hrs. pumping 60 g.p.m. _____ ft. after _____ hrs. pumping _____ g.p.m.										
			11 WATER QUALITY in Parts Per Million: Iron (Fe) _____ Chlorides (Cl) _____ Hardness _____ Other _____										
			12 WELL HEAD COMPLETION: <input type="checkbox"/> In Approved Pit <input checked="" type="checkbox"/> Pitless Adapter <input type="checkbox"/> 12" Above Grade										
			13 Well Grouted? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Neat Cement <input type="checkbox"/> Bentonite <input type="checkbox"/> _____ Depth: From _____ ft. to _____ ft.										
			14 Nearest Source of possible contamination 25 feet Direction SEPTIC Type _____ Well disinfected upon completion <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No										
GROUND SURFACE ELEV. 855 STATIC WATER ELEV. 835			15 PUMP: <input checked="" type="checkbox"/> Not installed Manufacturer's Name _____ Model Number _____ HP _____ Volts _____ Length of Drop Pipe _____ ft. capacity _____ G.P.M. Type: <input type="checkbox"/> Submersible <input type="checkbox"/> Jet <input type="checkbox"/> Reciprocating										
			16 Remarks, elevation, source of data, etc. <div style="border: 1px solid black; height: 50px; width: 100%;"></div>										
			17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. Ben K. Dilling REGISTRATION NO. 0067 Address 1126 SMALL LAKE DR. OCEAN Signed Robert Hayward AUTHORIZED REPRESENTATIVE Date 4/4/73										

047d

100M (Rev. 12-68)

LOCAL HEALTH DEPT. COPY

2 PAGES REDACTED
DUE TO PII AND
GEOGRAPHICAL LOCATION

October 1, 1959

Lexington Greens
Kalamazoo, Michigan

LOG OF 12" PERMANENT WELL:

0'	1'		Top soil	
1'	2'	1'	Clay loam	
2'	7'	5'	Hard pack sand	
7'	12'	5'	Soft sandy clay seepage	
12'	16'	4'	Sandy clay and stones	
16'	22'	6'	Firm sandy clay	
22'	40'	18'	Soft sandy blue clay	
40'	65'	25'	Hard blue clay	
65'	80'	15'	Sandy firm blue clay	
80'	89'	9'	Water bearing fine sand .010 slot	
89'	90'	1'	Water bearing fine sand & gravel, trace of clay	20' Static level
90'	93'	3'	Water bearing fine sand & sm. size gravel	
93'	102'	9'	Water bearing darker fine sand & sm. gravel	
102'	109'	7'	Water bearing clean sand, fine to coarse	
109'	116'	7'	Blue gravelly clay	
116'	125'	9'	Hard blue clay	
125'	133'	8'	Sharp to coarse water bearing sand & sm. gravel	
133'	136'	3'	Sharp sand to fine gravel	
136'	137'	1'	Sharp sand and clay balls	
137'	156'	19'	Sharp to coarse clean sand	
156'	171'	15'	Sharp to coarse clean sand	
171'	180'	9'	Sharp to coarse sand, trace of clay	
180'	182'	2'	Sandy blue clay	

(Note) Static water level 20' or less
12" pipe to depth of 109 feet
8" pipe from 109 feet to a depth of 132 feet.

GROUND SURFACE ELEV. 855
STATIC WATER ELEV. 835

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT

OF
PUBLIC HEALTH

14

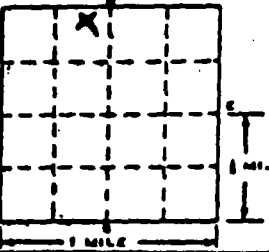
1 LOCATION OF WELL			2 FORMATION			3 OWNER OF WELL:		
County	Twp.	Fraction	Section No.	Range	...			
Kal	Fortage	1/4 1/4 1/4		N/S.	E/W.			
Distance And Direction from Road Intersections 50 ft. E. of Sprinkle Rd C/10ths N. S. of Alden Ave						OWNER No. _____		
Street address & City of Well Location						3 OWNER OF WELL: Hoffman Construction Co. Address 3915 Ravine Rd. Kalamazoo, Michigan		
2 FORMATION						4 WELL DEPTH: (completed) 107 ft. Date of Completion 11 / 20 / 62		
THICKNESS OF STRATUM						5 <input type="checkbox"/> Cable tool <input type="checkbox"/> Rotary <input type="checkbox"/> Driven <input type="checkbox"/> Dug		
DEPTH TO BOTTOM OF STRATUM						<input type="checkbox"/> Hollow rod <input checked="" type="checkbox"/> Jetted <input type="checkbox"/> Bored <input type="checkbox"/> _____		
sand						6 USE: <input type="checkbox"/> Domestic <input type="checkbox"/> Public Supply <input type="checkbox"/> Industry		
sand, clay						<input type="checkbox"/> Irrigation <input type="checkbox"/> Air Conditioning <input checked="" type="checkbox"/> Commercial		
clay						<input type="checkbox"/> Test Well <input type="checkbox"/> _____		
sand, silt						7 CASING: Threaded <input type="checkbox"/> Welded <input type="checkbox"/> Height: Above/Below surface 1 ft.		
clay						Diam. 2 in. to _____ ft. Depth _____ in. to _____ ft. Depth _____ Drive Shoe? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
sand, coarse						8 SCREEN: Type: Wire wound Dia. 1		
						Slot/Gauge 12 Length 1		
						Set between _____ ft. and _____ ft.		
						Fittings: Bremor check valve		
						9 STATIC WATER LEVEL 18 ft. below land surface		
						10 PUMPING LEVEL below land surface		
						_____ ft. after _____ hrs. pumping _____ g.p.m.		
						_____ ft. after _____ hrs. pumping _____ g.p.m.		
						11 WATER QUALITY in Parts Per Million:		
						Iron (Fe) _____ Chlorides (Cl) _____		
						Hardness _____		
						12 WELL HEAD COMPLETION: <input type="checkbox"/> In Approved PH <input type="checkbox"/> Pitless Adaptor <input checked="" type="checkbox"/> 12" Above Grade		
						13 GROUTING: Well Grouted? <input type="checkbox"/> Yes <input type="checkbox"/> No		
						Material: <input type="checkbox"/> Neat Cement <input type="checkbox"/> _____		
						Depth: From _____ ft. to _____ ft.		
						14 SANITARY: Nearest Source of possible contamination ?		
						_____ feet _____ Direction _____ Type _____		
						Well disinfected upon completion <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
GROUND ELEV.: 863						15 PUMP: Manufacturer's Name: NONE		
GROUND WATER ELEV.: 845						Model Number: HP		
						Length of Drop Pipe _____ ft. capacity _____ G.P.M.		
						Type: <input type="checkbox"/> Submersible <input type="checkbox"/> _____		
						<input type="checkbox"/> Jet <input type="checkbox"/> Reciprocating		
16 Remarks, elevation, source of data, etc.						17 WATER WELL CONTRACTOR'S CERTIFICATION:		
						This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.		
						_____ REGISTERED BUSINESS NAME		
						Address: _____		
						Signed: _____ Date: 11/22/62		
						AUTHORIZED REPRESENTATIVE		

WATER WELL RECORD

ACT 284 PA 1968

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

15

1 LOCATION OF WELL		TOWNSHIP NAME		Fraction	Section Number	Town Number	Range Number
County <u>HAL.</u>		<u>PORTAGE</u>		<u>N 8 1/2 W 1/2</u>	<u>12</u>	<u>3 RS.</u>	<u>11 N.W.</u>
Distance And Direction from Road Intersections <u>3700 East Milham Rd.</u>				3 OWNER OF WELL: <u>ROTE FINISH CO.</u> Address <u>3700 E. Milham Rd.</u>			
Street address & City of Well Location <u>3700 E. Milham</u>				4 WELL DEPTH: (completed) Date of Completion <u>80</u> ft. <u>5-3-76</u>			
Locate with "X" in section below 				5 <input checked="" type="checkbox"/> Cable tool <input type="checkbox"/> Rotary <input type="checkbox"/> Driven <input type="checkbox"/> Cus <input type="checkbox"/> Hollow rod <input type="checkbox"/> Jetted <input type="checkbox"/> Bored <input type="checkbox"/>			
				6 USE: <input type="checkbox"/> Domestic <input type="checkbox"/> Public Supply <input checked="" type="checkbox"/> Industry <input type="checkbox"/> Irrigation <input type="checkbox"/> Air Conditioning <input type="checkbox"/> Commercial <input type="checkbox"/> Test Well <input type="checkbox"/>			
				7 CASING: Threaded <input checked="" type="checkbox"/> Welded <input type="checkbox"/> Height: Above/Below Glen. Surface <u>2</u> ft. <u>6</u> in. to <u>70</u> ft. Depth Weight <u>19</u> lbs./ft. <u>in.</u> to <u>ft.</u> Depth Drive Shoe? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
2 FORMATION		THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	8 SCREEN: Type <u>Lead pipe + plug</u> Dia: <u>2"</u> Slot/Gauge <u>10</u> Length <u>10 ft</u> Set between <u>70</u> ft. and <u>80</u> ft. Fittings: STATIC WATER LEVEL <u>15</u> ft. below land surface 10 PUMPING LEVEL, below land surface <u>35</u> ft. after <u>2</u> hrs. pumping <u>250</u> g.p.m. <u>ft.</u> after <u>hrs.</u> pumping <u>g.p.m.</u>			
<u>Gravel + clay</u>		<u>18</u>	<u>18</u>	9 WATER QUALITY in Parts Per Million Type (Fe) <u>Chloride (Cl)</u> Hardness <u>Other</u>			
<u>Sand</u>		<u>10</u>	<u>28</u>	12 WELL HEAD COMPLETION: <input type="checkbox"/> In Approved Pit <input type="checkbox"/> Pitless Adapter <input checked="" type="checkbox"/> 12" Above Grade			
<u>Sand + clay</u>		<u>40</u>	<u>68</u>	13 Well Grouted? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Neat Cement <input type="checkbox"/> Bentonite <input type="checkbox"/> Depth: From <u>ft.</u> to <u>ft.</u>			
<u>Water sand</u>		<u>12</u>	<u>80</u>	14 Nearest Source of possible contamination <u>ft.</u> <u>ft.</u> Direction <u>Type</u> Well disinfected upon completion <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
<u>GRAY CLAY</u>				15 PUMP <input type="checkbox"/> Not installed Manufacturer's Name <u>REDA</u> Model Number <u>46888</u> H.P. Volts <u>440</u> Length of Drop Pipe <u>4</u> ft. capacity <u>200</u> G.P.M. Type: <input checked="" type="checkbox"/> Submersible <input type="checkbox"/> Jet <input type="checkbox"/> Recirculating			
GROUND ELEV: <u>864</u>				16 Remarks, elevation, source of data, etc. <u>F.C.</u>			
GROUND WATER ELEV: <u>849</u>				17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. <u>Walter Adams</u> <u>436</u> REGISTERED BUSINESS NAME REGISTRATION NO. Address <u>HAL.</u> Signed <u>Walter Adams</u> Date <u>5-3-76</u> AUTHORIZED REPRESENTATIVE			

100M (Rev. 12-68)

LOCAL HEALTH DEPT. COPY



SUBSURFACE EXPLORATION

P.O. Box 116 Lowell, Mich. 49331 • Bus. Phone: (616) 897-8581

Project Kalamazoo Cork Sreet Landfill

Job No. _____

Location Kalamazoo, Michigan

Permit No. _____

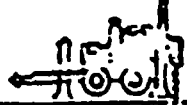
LOG OF BORING

Boring Number <u>M57#4</u>	Crew Chief <u>Klitz</u>	Ground Water: Encountered at <u>12'±</u> ft.	Plugging Record
Depth Drilled <u>30</u> ft.	Helper <u>Leasure</u>	After Completion <u>11'7"</u> ft.	Boring Sealed with: <u>Bentonite 0'to3</u>
Surface Elev. _____ ft.	Drill Rig <u>55</u>	After _____ hrs. _____ ft.	_____ between <u>0</u> ft. & <u>30</u> ft.
Date Started <u>6/19/81</u>	Boring Method <u>HSA</u>	Volume _____	_____ between _____ ft. & _____ ft.
Date Completed <u>6/19/81</u>	_____ <u>8"</u>	Seepage at _____ ft.	_____ between _____ ft. & _____ ft.

Depth in Feet	Sample Type	Penetration ASTM D 1526	SOIL DESCRIPTION.
2.0'			Topsoil- Clay, moist, dark-brown.
3.5'			
6.0'		5-4-6	Clay- Moist, gray, very sandy, occ. pebbles
			Sand- Compact, brown, med-coarse, trace of gravel, fine.
		6-10-10	Sand- Very compact, brown, med-coarse, with gravel, fine-med.
12.0'			
		2-2-5	Sand- Compact, brown, coarse with gravel, fine.
		7-8-11	
22.5'			
		2-2-3	Clay- Firm, gray-brown, very sandy, with pebbles.
30.0'		3-7-14	Sand- Ext. compact, brown, fine-med.
	EOB		

GROUND SURFACE ELEV. 846.4
 STATIC WATER ELEV. 830.4

12/81



GEO-TEK INC.

SUBSURFACE EXPLORATION

P.O. Box 116 Lowell, Mich. 49331 • Bus. Phone: (616) 897-5581

Project Kalamazoo Cork Street Landfill Job No. _____
Location Kalamazoo, Michigan Permit No. _____

LOG OF BORING

B17 MG

Boring Number <u>1</u>	Crew Chief <u>Klierz</u>	Ground Water: Encountered at <u>22.5'</u> ft.	Plugging Record
Depth Drilled <u>36</u> ft.	Helper <u>Leasure</u>	After Completion <u>7'</u> ft.	Boring Sealed with: <u>Ex. Soil</u>
Surface Elev. <u>71</u>	Drill Rig <u>55</u>	After <u> </u> hrs. <u> </u> ft.	Between <u>0</u> ft. & <u>35</u> ft.
Date Started <u>6/1/81</u>	Boring Method <u>B'HSA</u>	Volume <u>slight</u>	cent between <u>20</u> ft. & <u>36</u> ft.
Date Completed <u>6/1/81</u>		Seepage at <u>7'</u> ft.	Between <u> </u> ft. & <u> </u> ft.

Depth in Feet	Sample Type	Penetration ASTM D 1586	SOIL DESCRIPTION.
7.0'	3-4-4		Fill Sand- Slightly compact, dark-brown, black, with occ. traces of rubble, occ. stones, occ. slight clay binder.
14.5'	2-4-7		Fill Sand- Compact, brown, and dark-brown, with some rubble, paper and wood.
17.0'	1-1-1		Fill Topsoil- Sand, loose, damp, dark-brown, med., trace of roots, trace of glass, trace of sand, brown, fine.
22.5'	x 4-3-4		Fill Sand- Slightly compact, dark-brown, with wood, glass.
27.5'	stone 10-14-17		Sand- Ext. compact, brown, med., with gravel, med., to coarse.
36.0'	9-12-15		Sand- Ext. compact, brown, med., with some gravel, fine.
	1-10-33		
	EOB		

GROUND SURFACE ELEV. 827.8
STATIC WATER ELEV. 818.8 12/81

GEO-TEK INC.

SUBSURFACE EXPLORATION

B.A.R. 30

P.O. Box 116 Lowell, Mich. 49331 • Bus. Phone: (616) 897-5581

Project Kalamazoo Cork Street Landfill
 Location Kalamazoo, Michigan

Job No. _____

Permit No. _____

LOG OF BORING

Boring Number <u>W# 2</u> Depth Drilled <u>45</u> ft. Surface Elev. _____ ft. Date Started <u>6/19/81</u> Date Completed <u>6/19/81</u>	Crew Chief <u>Klitz</u> Helper <u>Leasure</u> Drill Rig <u>55</u> Boring Method <u>HSA</u>	Ground Water: Encountered at <u>34'</u> ft. After Completion _____ ft. After _____ hrs: _____ ft. Volume _____ Sample at <u>9.5'</u> ft.
		Plugging Record Boring Sealed with: <u>Bentonite</u> _____ between _____ ft. & _____ ft. _____ between _____ ft. & _____ ft. _____ between _____ ft. & _____ ft. _____ between _____ ft. & _____ ft.

Depth in Feet	Sample Type	Penetration ASTM D 1586	SOIL DESCRIPTION
			Fill Clay- Firm, brown and gray, sandy, occ. stones, trace of organic clay.
7.5'		3-4-4	
12.0'		5-4-6	Clay- Stiff, blue, very sandy, organic, with roots, trace of sand seams.
18.0'		6-7-9	Clay- Stiff, brown, very sandy, with pebbles, occ. stones.
21.5'		9-11-14	Clay- Ext stiff, brown, very sandy, occ. pebbles.
28.0'		11-14-15	Sand- Ext. compact, brown, fine-med., with very heavy clay binder, with occ. pebbles.
34.0'		24-44-76	Sand- Ext. compact, brown, med., with a clay binder, with pebbles, occ. stones.
36.5'		21-30-44	Sand- Ext. compact, brown, med-coarse with some gravel fine.

GEO-TEK INC.
SUBSURFACE EXPLORATION
 P O Box 116 Lowell, Mich. 48331 • Bus. Phone: (616) 897-5581

* Push to 1

Project Kalamazoo Cork Street Landfill Job No. _____
 Location Kalamazoo, Michigan Permit No. _____

LOG OF BORING

Boring Number <u>333 3</u>	Crew Chief <u>Klitz</u>	Ground Water: Encountered at <u>6'±</u> ft.	Plugging Record Bertonite
Depth Drilled <u>35.5' ft.</u>	Helper <u>Leasure</u>	After Completion <u>5'1"</u> ft.	Boring Sealed with: <u>0</u> ft. & <u>21</u> ft.
Surface Elev. _____ ft.	Drill Rig <u>55</u>	After _____ hr. _____ ft.	_____ between <u>15.5</u> ft. & <u>20.5</u> ft.
Date Started <u>6/18/81</u>	Boring Method <u>HSA</u>	Volume _____	_____ between <u>27</u> ft. & <u>30</u> ft.
Date Completed <u>6/18/81</u>		Seepage at _____ ft.	_____ between _____ ft. & _____ ft.

Depth in Feet	Sample Type	Penetration ASTM D 1586	SOIL DESCRIPTION
			Fill Sand- Slightly compact, dark-brown, black, med., with some gravel, med., concrete, wood, glass.
6.0'		5-2-3	
7.0'			Clay- Moist, gray-brown, and black, organic.
		11-7-4	Sand- Compact, brown, med-coarse, with gravel, occ. rubble.
12.5'			
15.5'	*	4-5-9	Sand- Compact, brown, med., with some occ. gravel, trace of occ. layers of clay, brown, sandy, with pebbles.
		10-15-21	Clay- Ext. stiff, brown, sandy, with pebbles, occ. stones.
22.5'			
		3-3-10	Sand- Compact, brown, fine-med., trace of clay in sampler tip.
29.0'			
		9-14-19	Clay- Ext. stiff, brown, very silty, with sand layers.
32.0'			
		15-21-28	Sand- Ext. compact, brown, med-coarse with some gravel, fine.
35.5'			

GROUND SURFACE ELEV. 811.9
 STATIC WATER ELEV. 805.9 12/81

WILKINS & WHEATON TESTING LABORATORY

EOB

3 PAGES REDACTED
DUE TO PII AND
GEOGRAPHICAL LOCATION

LINE#

ADDENDUM
(A)

MONITORING WEA LOGS

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WILKINS & WHEATON TESTING LABORATORY, INC.

KALAMAZOO, MICHIGAN

LOG OF BORING NO. MW1A

Kalamazoo County
Road CommissionDATE January 28, 1986SURFACE ELEV. 848.67LOCATION Kalamazoo County Road Commission

DEPTH, FEET	SAMPLES	SAMPLING RESISTANCE	SYMBOL	DESCRIPTION	DEPTH BELOW SURFACE	ELEVATION	NATURAL MOISTURE CONTENT
0				Asphalt	.33'	848.34	
				Fill: Dark brown fine to coarse sand and gravel, trace of silt	2.0'	846.67	
5				Light brown fine to coarse sand and gravel. Trace of silt.			
10					10.36	838.31	
15					15.0	833.67	
				Light gray brown silty clay, trace of sand and gravel.	18.0	830.67	
20				End of Boring			

COMPLETION DEPTH 18.0'WATER DEPTH 10.36'DATE January 28, 1986

WILKINS & WHEATON TESTING LABORATORY, INC.

KALAMAZOO, MICHIGAN

LOG OF BORING NO. MW2A

Kalamazoo County
Road CommissionDATE January 28, 1986SURFACE ELEV. 847.15

LOCATION

DEPTH, FEET	SAMPLES	SAMPLING RESISTANCE	SYMBOL	DESCRIPTION	DEPTH BELOW SURFACE	ELEVATION	NATURAL MOISTURE CONTENT
0				Asphalt	.42	846.73	
				Light brown, fine to coarse sand & Dark brown, fine to coarse gravel sand and gravel	2.0	845.15	
					3.0	844.15	
5	6			Gray brown, fine to coarse sand with fine to medium gravel. Trace of silt.	8.0	839.15	
	7			Light brown, fine to coarse sand, trace of silt.	9.0	838.15	
10	6				10.33	836.82	
	9			Gray brown, fine to coarse sand, fine to medium gravel, some silt.	12.5	834.65	
	8			Light brown, fine to medium sand, trace of silt.	17.0	830.15	
15	5						
	3			Light brown, sandy silt, occasional layers of fine to medium sand.	20.5	826.65	
	4			End of Boring			
20	2						
	4						
	5						
25							

COMPLETION DEPTH 20.5'WATER DEPTH 10.33'DATE January 28, 1986

WILKINS & WHEATON TESTING LABORATORY, INC.

KALAMAZOO, MICHIGAN

LOG OF BORING NO. MW3A

Kalamazoo County

Road Commission

DATE January 28, 1986

SURFACE ELEV. 842.60

LOCATION

DEPTH, FEET	SAMPLES	SAMPLING RESISTANCE	SYMBOL	DESCRIPTION	DEPTH BELOW SURFACE	ELEVATION	NATURAL MOISTURE CONTENT
5	3	3					
10	1 1/2	11			8.84	833.76	
15	39	29					
20	3	8			22.5	820.10	
25	4	8			27.5	815.10	
30				End of Boring			

Fill: Blackish brown, silty, sandy, gravelly clay, with organic material and wood.

Yellow brown, silty fine to coarse sand and gravel, occasional large gravel.

COMPLETION DEPTH 27.5'

WATER DEPTH 8.84'

DATE January 28, 1986

WILKINS & WHEATON TESTING LABORATORY, INC.

KALAMAZOO, MICHIGAN

LOG OF BORING NO. MW4A

Kalamazoo County
Road Commission

DATE January 28, 1986

SURFACE ELEV. 842.83

LOCATION

DEPTH, FEET	SAMPLES	SAMPLING RESISTANCE	SYMBOL	DESCRIPTION	DEPTH BELOW SURFACE	ELEVATION	NATURAL MOISTURE CONTENT
0							
5	3	513		Fill: Dark brown clayey, silty fine to coarse sand and gravel.			
					7.28	835.55	
					8.0	834.83	
10	2	112		Light brown clayey, silty, fine to coarse sand, and fine gravel, slight clay binder.			
					13.0	829.83	
15	13	1413		Brown medium to coarse sand and gravel, trace of silt.			
					18.0	824.83	
20	10	113		Yellow brown, silty, clayey coarse sand, medium to coarse gravel.			
					20.5	822.33	
25				End of Boring			

COMPLETION DEPTH 20.5'

WATER DEPTH 7.28'

DATE January 28, 1986

WILKINS & WHEATON TESTING LABORATORY, INC.
KALAMAZOO, MICHIGAN

LOG OF BORING NO. 1M5A

DATE January 28, 1986

SURFACE ELEV. 838.40

LOCATION Kalamazoo County Road Commission

DEPTH, FEET	SAMPLES	SAMPLING RESISTANCE	SYMBOL	DESCRIPTION	DEPTH BELOW SURFACE	ELEVATION	NATURAL MOISTURE CONTENT
0				Fill: Dark brown, silty clayey fine to medium sand and gravel.			
				-----▽-----	3.0	835.40	
					3.61	834.79	
5	N			Fill: Black, clayey fine to coarse sand and gravel, large amount of organic material and wood	7.0	831.40	
10	N			Fill: Greenish black, clayey, silty, fine to medium sand and gravel, metal, wood, organic material.	12.0	826.40	
15	N			Light brown, fine to coarse sand, slightly silty, occasional fine gravel.	18.0	820.40	
20				End of Boring			

COMPLETION DEPTH 18.0'

WATER DEPTH 3.61'

DATE January 28, 1986